CLARK COUNTY, WASHINGTON

FINAL DRAFT

STORMWATER MANAGEMENT PROGRAM

1999 TO 2003

SEPTEMBER 30, 1998

REVISED APRIL 15, 1999

in partial fulfillment of

The National Pollutant Discharge Elimination System
Municipal Stormwater Permit Part 2 Application

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Municipal Stormwater Permit Part 2 Application

Submitted to the

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
OLYMPIA, WASHINGTON

Prepared by the
Clark County Public Works Department

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EXECUTIVE SUMMARY OF THE DRAFT CLARK COUNTY NPDES STORMWATER MANAGEMENT PROGRAM REPORT

March 1999

BACKGROUND

Clark County is required by the State of Washington, under the federal Clean Water Act, to obtain a waste discharge permit for all County-owned storm sewers that empty to surface water or groundwater. The permit is referred to as a NPDES (National Pollutant Discharge Elimination System) permit. The intent of the NPDES permit is to protect waters for use by wildlife and the public by controlling adverse impacts of stormwater runoff, which are excessive erosion of stream channels and pollutants.

Under the Federal Clean Water Act, any municipality having greater than 100,000 residents in the 1990 census is required to obtain a permit. In January 1995, The Washington Department of Ecology notified Clark County of the need to submit a permit application. The first part of the application, called the Part 1 application was submitted in October 1996 and was approved by the State in May 1997. The second and final application requirement, called the Part 2 application, consists of the Stormwater Management Program Report that describes what the County will do to reduce stormwater impacts during the first five-year permit term (1999 to 2003).

MUNICIPAL SEPARATE STORM SEWER DEFINED

According to federal NPDES regulations, a municipal separate storm sewer is: *a conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains): (i) owned or operated by a state, city, town, borough, county,* parish, district, association, or other public body (created by or pursuant to state law) having jurisdiction over disposal of wastes, stormwater, or other wastes, including special districts such as a sewer district, flood control district or drainage district; (ii) *designed or used for collecting or conveying stormwater*; (iii) which is not a combined sewer; and (iv) which is not part of a Publicly Owned Treatment Works.

THE STATE'S APPROACH TO ADDRESSING NPDES MUNICIPAL STORM SEWER DISCHARGES

NPDES permitting requires two basic approaches to control pollutant discharges. One is source control, which keeps pollutants from entering stormwater. The other is treatment to remove the pollutants already in the stormwater. To accomplish this, the core requirement of the NPDES permit is a *stormwater management program*.

Based on existing Municipal Storm Sewer permits in the Puget Sound Basin, the NPDES permit issued for Clark County will address water resource problems that go beyond pollutant discharge to include issues such as protecting riparian habitat, controlling excess runoff from new development, and protecting wetlands. The State expects the County to address problems cause by existing development as well as regulating new development.

PRIORITIES

Overall Priorities

Stormwater Management Priorities – Summary

Identifying the many problems associated with stormwater has shown how interdependent stormwater runoff management and protecting aquatic resources are. Clark County's stormwater management program is in an initial phase as a unified process under NPDES permit requirements. A systematic approach to stormwater management is a new activity at the County. Development of overall County priorities to address all of the stormwater problems was not completed at this early stage in the program. The following stormwater management priorities are established for the first permit term:

- Identify Revenue Sources for Stormwater Management
- Protect Public Safety and Property
- Take Immediate Actions to Prevent Further Water Resource Degradation
- Improve the Information for Making Stormwater Management Decisions
- Involve the Public in Stormwater Management Decision Making
- Educate the Public to Protect Water Resources

Program Element Priorities

The County examined its priorities for managing stormwater runoff and established basic priorities for large County programs such as the Operation and Maintenance of Storm Sewers and Roads and the Regulatory Program. Each of these programs identified key activities that needed to be performed to meet specific permit requirements or to better protect water resources.

Funding

Establishing a source of revenue for stormwater management activities is the main priority at the start of the permit term. In other jurisdictions, storm sewer fees have been used as a revenue source to implement many of the NPDES stormwater management program actions.

Reducing pollutants to the "maximum extent practicable" will mandate new actions such as increased regulation for stormwater runoff, building stormwater facilities for

existing development, and expanding outreach programs to improve source controls. A new program will be required to regulate and reduce pollutants in stormwater discharges from businesses to the County storm sewers. The County will also have to implement several changes in its existing stormwater regulatory program to make it substantially equivalent to Puget Sound standards.

Coordination and Public Involvement

Many actions to protect or rehabilitate streams or wetlands are performed by one or more organization. Implementing the NPDES stormwater management program will be linked also to the implementation of a County program to meet requirements of the Endangered Species Act. This requires a program to coordinate actions and involve the public.

ELEMENTS

The stormwater management program comprises five main program elements:

- Operation and Maintenance;
- Regulatory;
- Capital Improvement;
- Monitoring and Evaluation; and
- Public Involvement and Education.

There is a brief description of the main unmet needs for each of these program elements. This is followed by a summary of major issues, strategy, time line, and budget.

Each continued current action and proposed new action included in the approved stormwater management program will require a dedicated source of revenue from an existing program or a new source.

Operations and Maintenance

The County maintains both storm sewers and road ways. The State expects some increase in the inspection and maintenance of storm sewers in order to comply with the NDPES permit.

Major issues: Storm sewer maintenance has been performed at a level necessary to keep the system functioning and respond to complaints. Funding is not sufficient for routine inspection and maintenance.

Strategy: The strategy is to establish a systematic maintenance program. The program would include: establishing an inspection and maintenance system; completing storm sewer mapping and inventory; adding computerized maintenance tracking; added street sweeping; and performing private facilities maintenance inspections.

Time line: The proposed time line is to begin establishing the upgraded program during the first year of the permit. Staff and equipment transferred from servicing the annexed area would perform much of the added work. Actions will be prioritized to most effectively use any new revenue.

Budget: The current annual budget of approximately $2,500,000 (largely from the Road Fund) for road and storm sewer maintenance is not able to support any added storm sewer maintenance. The proposed actions cost about a $1,000,000 per year which is expected to be funded by the Road Fund.

Regulatory

Regulatory programs are required to address the impacts of new development on streams and wetlands. A regulatory program is also required to reduce pollutants entering stormwater from existing development. There are substantial state-mandated requirements for new actions that include: establishing a maintenance program for privately owned storm sewers; revisions to the stormwater control ordinance to meet current and new State standards; upgrading the erosion control program to meet State standards; and adding inspection and enforcement staff.

Major issues: The current regulatory program has a strong foundation for regulating new development. Substantial changes are required for development regulations for stormwater controls and erosion from constructions. New programs are required for the County to control discharges from private systems to County storm sewers.

Strategy: The County proposes to meet the state requirements for development regulations and a regulatory program for controlling pollutants from existing development. The County is also committed to improving the effectiveness of current regulations for erosion control and stormwater controls.

Time line: The permit will require the County to perform a substantial part of the regulatory program upgrade within the 12 to 18 months of the permit. Current programs are in need of increased inspection and enforcement. For this reason, there is a large increase in the program during year one of the permit (1999).

Budget: The current annual budget is about $850,000 (almost entirely from Development Fees). The initial increase is approximately $1,000,000 for the first year. After establishing the program in the first two years the added cost drops to approximately $580,000 per year. Revenue would be from increased Development Fees and/or an unidentified revenue source.

Capital Improvements

Stormwater capital improvements by the County currently address inadequacies in the drainage system and are generally small projects. Some projects such as fish passage barrier removal improve habitat. Huge ongoing interagency projects, known as Conservation Futures, to purchase open space or restore riparian areas and wetlands are included in the capital program. Stormwater control facilities for new development are addressed by requirements for developers to build controls on site. Significant unmet needs include: complete mapping of storm sewers; a program to develop and prioritize projects to improve stormwater quality; and a revenue source for stormwater projects to address existing problems and habitat rehabilitation.

Major issues: Projects to construct stormwater controls for existing development, rehabilitate streams and wetlands, and purchase development rights on flood plains are expensive. There is no significant dedicated revenue to design, select and build stormwater capital projects.

Strategy: The approach to capital projects for stormwater management involves several steps. First, there needs to be a County priority for the use of capital projects; for example, enhance good and excellent resources or rehabilitate urban streams. A process needs to be established to select individual projects based on County priorities and the budget. Basin characterization needs to be completed to determine the type and location of projects that will have the greatest benefit to aquatic habitat. The existing capital program for roads can handle project management for stormwater projects. There also needs to be a revenue source sufficient to sustain a capital program.

Time line: The proposed time line is to establish the capital priorities and selection process during the first two years of the permit term. Watershed characterization should begin during this period. Depending on County priorities, capital projects can begin at any time revenue is available. The program budget expects to begin building significant projects during the third year.

Budget: The current budget for stormwater projects and fish barrier removal is about $3,900,000 (largely from the Road Fund) for 1998 and 1999. About $1,900,000 of this is a one-time project to address serious drainage problems in Lakeshore and Salmon Creek area. A proposed budget of $1,100,000 per year is added in year three of the permit to for projects to begin to lessen stream degradation from exiting development.

Monitoring and Evaluation

Monitoring provides information needed to make management decisions for regulatory, capital improvement and public outreach programs. Current actions include grant funded special projects, such as best management practices evaluation and limited stream and rainfall monitoring. Monitoring needs that are unmet include: establishing a centralized database for environmental and land use data; screening for pollutants in storm sewers; mapping storm sewers; collecting data for

calibrating hydrologic models; maintaining hydrologic models; and characterizing the health of watersheds for prioritizing management actions. Evaluation includes examining the success of County programs and filing annual reports for the permit.

Major issues: The current program does not meet the permit requirement or perform data gathering and analysis to support watershed management or capital programs. Watershed characterization is also likely to be a part of a local program to protect Pacific Northwest salmon and Steelhead habitat under the Endanger Species Act. A revenue source is required to fund any increase in monitoring.

Strategy: The program will focus on establishing the activities that support stormwater management, such as storm sewer mapping, establishing a database and maintenance system, and screening storm sewers for pollution sources. Current projects such as Lacamas Lake monitoring will be maintained. Watershed characterization will probably be closely tied to Endangered Species Act actions and will not begin on a large scale until a clear direction is established for the Endangered Species Act.

Time line: The first year will be dedicated to establishing the basic program activities such as consolidating data and mapping storm sewers. It is anticipated that a larger effort for watershed characterization and stream gauging will begin in the second or third year of the permit.

Budget: The current monitoring and evaluation budget is about $118,000 (revenue from several sources) not including cost of preparing the NPDES application. The first year of the permit projects an increase of about $190,000 (total $356,000) largely for storm sewer mapping, establishing the centralized database, and adding monitoring to public outreach activities. In year two, when stream flow data collection and watershed characterization is anticipated to begin, the budget increases to about $600,000 per year. The budget projections and revenue sources are uncertain because monitoring requirements and grants tied to implementing the Endangered Species Act program are unknown.

Public Outreach and Education

Public Outreach includes education activities, involving the public in forming policies, and technical support for complying with county regulations. Waste and pollutant reduction programs provide a good basis for NPDES requirements to educate the public to reduce the use of, and better manage toxic materials. Major unmet needs include: waste reduction specific to stormwater management; implementing stream stewards and river rangers programs; better coordination, involving the public in defining policies for stormwater management; forming a watershed advisory group to establish a revenue source, coordinate actions, and set priorities for stormwater and watershed management; and completing basin plans.

Major issues: The permit requires an education program to reduce toxic materials and nutrients in stormwater runoff. The current program partially meets this requirement. Many current programs are grant funded and may loose their revenue

source. Increasing involvement for watershed planning and stream stewardship is a main goal of the program.

Strategy: Current programs will be enhanced to address pollutants in stormwater runoff. A county-wide watershed advisory group will be established to help set policies for funding stormwater management and watershed management activities under the Endangered Species Act, as well as overall policies for stormwater management. Increased public involvement will establish a stream steward program.

Time line: Increased involvement is a cornerstone of implementing the NPDES stormwater program and a watershed management program under the Endangered Species Act. Substantial increases are proposed for the first year of the permit. Education is generally considered to be the most effective tool for reducing pollutants from household activities and businesses. Education will be stepped up in the first yea of the permit term.

Budget: The current budget of $727,000 (largely grants) includes an annual cost of $300,000 to properly dispose of household hazardous wastes dropped off at collection centers. The proposed first year budget increases to $1,030,000 and decreases to $728,000 in the fifth year. Decreases are due largely to the expiration of existing grants and conclusion of watershed planning phases. No revenue source is identified for the new projects.

CONCLUSION

The Washington Department of Ecology requires Clark County to obtain a State Waste Discharge Permit to protect waters used by wildlife and the public by controlling adverse impacts of stormwater runoff, which are excessive erosion of stream channels and pollutants. The main State requirement is that the County develop and implement a stormwater management program and water quality ordinance to reduce the adverse affect of stormwater runoff. To successfully implement the management program and ordinance, additional funding and support by the community, as well as elected officials, is necessary. As part of the public review process, the community and elected officials will have an opportunity to determine what the final NPDES stormwater management will look like and how it will be funded.

CHAPTER 1

INTRODUCTION

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CHAPTER 1

INTRODUCTION

BACKGROUND

Clark County is required by Washington State and the Federal Clean Water Act to obtain a NPDES waste discharge permit for all storm sewers that discharge to surface water or groundwater. The Washington Department of Ecology (Ecology) is required by the U.S. Environmental Protection Agency (EPA) to have Clark county obtain the waste discharge permit. The State-issued NPDES has a five-year term and must be renewed indefinitely.

Discharges to surface water require a National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer permit issued by Ecology as a requirement of the Federal Clean Water Act. Along with discharges to surface water which are normally permitted under the NPDES system, the Ecology will also include stormwater discharges to groundwater in the NPDES permit.

Certain industrial facilities and construction activities are required to have NPDES industrial stormwater permit coverage and must obtain their own NPDES permit coverage from Ecology. The NPDES permit area does not include cities, state or federally owned lands, private lands used for agriculture, or private lands used as forest production.

PURPOSE

The purpose of this document is to present a five year stormwater management program (1999 to 2003) that describes the activities Clark County will perform to comply with the permit. This report will be submitted to Ecology as the main part of the Part 2 application. The program must be approved by Ecology prior to issuance of a permit to discharge stormwater runoff from Clark County-owned or County-operated storm sewers to waters of the State.

WHAT HAPPENS IF CLARK COUNTY DOES NOT OBTAIN AN NPDES PERMIT

Under State law, Ecology can write a NPDES permit and require Clark County to perform the actions in the permit. The Federal Clean Water Act is also particularly unforgiving of noncompliance. It has criminal penalties that include fines of up to $25,000 per day per violation for each outfall or imprisonment for not more than one year. The County has hundreds of stormwater pipe outfalls. The Clean Water Act also has provisions for citizen enforcement by citizen lawsuits. The citizen lawsuit provisions were designed to be easy to file and win against parties for noncompliance with a NPDES permit or the Clean Water Act. A lawsuit was filed against the County on May 21, 1998 by the Waste Action Project and the Clark County Natural

Resources Council alleging violation of the Clean Water Act by virtue of the County not currently having a NPDES stormwater permit issued by Ecology.

APPROACH FOR DEVELOPING THE CLARK COUNTY NPDES STORMWATER MANAGEMENT PROGRAM

Clark County and Ecology have simplified the NPDES permit application and stormwater management program by modeling the County application after the Puget Sound basin permits and municipal stormwater management programs.

NPDES permitting for Clark County follows after the process to permit the medium and large municipalities in the Puget Sound area. The Washington Department of Ecology has issued NPDES permits to cover City of Seattle, City of Tacoma, King County, Snohomish County, and the Washington Department of Transportation for the period of 1996 to 2000. The Puget Sound permittees negotiated a set of permit conditions acceptable to both the permittees and Ecology, and have also created and implemented programs to meet the permit requirements.

The approach used by Ecology and Clark County for preparing the permit applications is to create a stormwater management program to meet the permit conditions and clarifications agreed to by Ecology and the Puget Sound permittees. In additional to the Puget Sound permit requirements, Ecology is making added requirements based on the implementation of the Puget Sound programs and new information about best management practices (BMPs) for stormwater runoff. These changes are in a draft form but are being incorporated into the proposed Clark County program. These changes and all of the permit requirements are listed in Chapter 4.

Role of the Stormwater Management Program

End-of-pipe, or point discharge, waste water permits specify numerical limits for pollutant discharges to the receiving water. Stormwater discharges are considered nonpoint pollution, that is emanating from many separate points and contains pollutants from many sources. Stormwater permits do not set numerical standards for pollutant loading from each storm sewer outfall. State and federal regulations require municipalities to apply technology-based controls as a first step toward reducing pollutant loads to levels consistent with water standards. The state allows the permittee to develop and implement a stormwater management program that includes the use of BMPs to control and treat pollutants in stormwater and protect and restore "beneficial uses" of the receiving waters. The State standards for stormwater management in the Puget Sound region are included in the Stormwater Management Manual for the Puget Sound Basin (Washington Department of Ecology, February 1992), generally referred to as the Puget Sound Manual.

The program to satisfy the requirements of the Clean Water Act follows a schedule:

1. Adopt a stormwater management plan, at the time the first five-year permit is issued, that includes management priorities and an implementation schedule to address all components of the stormwater management program;
2. Assess the success of the program using monitoring and other evaluation efforts (after four years);
3. In subsequent permit cycles, re-evaluate the program; and
4. Implement more effective BMPs in subsequent permit terms.

Two basic approaches are used to control pollutant discharges. One is source control, which keeps pollutants from entering stormwater. The other is treatment, which attempts to remove the pollutants already in the stormwater. Source control is the most cost effective method to control stormwater pollution. A successful program will use both.

NPDES municipal storm sewer permits have provisions differing from point source permits:

- Implementation of a stormwater management program rather than traditional numerical standards for effluent discharge;
- Permits cover large areas that include hundreds or thousands of outfalls;
- Flexibility to allow the permittee to focus resources on the highest priorities;
- Encouragement of a watershed approach to comprehensively manage stormwater; and
- Emphasis on pollution prevention with requirements for controlling pollutants at their source and assessing methods to address future pollutant sources due to residential and commercial growth.

PERMIT APPLICATION PROCESS

The NPDES permit application process has a series of requirements that must be completed by the County and Ecology before a permit is issued. The process of obtaining a permit is lengthy and includes several steps. It is as follows:

1. Notification of Clark County by Ecology for the NPDES Part 1 application (January 1995);
2. Clark County submits the Part 1 application to Ecology (Submitted October, 1996, Approved May 1997);
3. Clark County completes stormwater quality characterization requirements (Submitted December 1997);
4. Clark County submits the Part 2 application including the stormwater management program approved by the Clark County Board on Commissioners, (Deadline October 1, 1998);
5. Clark County adopts an ordinance that provides legal authority to control pollutant discharges to County storm sewers (expected at the time the Part 2 application is submitted to Ecology);
6. Ecology holds a hearing on the permit application following local approval; and

7. Ecology issues the general permit within a year of receiving an approved stormwater management program (Anticipated in 1999).

Part 1 of the permit application was approved by Ecology in May 1997. The final step to obtain the permit is approval of the Part 2 application. The Part 2 application includes the core requirement of the NPDES permit, a stormwater management program which lists the activities to be performed by the County to reduce pollution caused by stormwater runoff.

REQUIREMENTS TO BE COMPLETED IN FOR THE PART 2 APPLICATION

Legal Authority

Ecology requires the County to adopt an ordinance that provides the County with adequate legal authority to control pollutant discharges to County-owned storm sewers. This requirement must be met at the time the locally approved Part 2 application is submitted to Ecology. An approved Puget Sound basin ordinance (King County Chapter 13.12) is used as the model for the Clark County ordinance.

Locally Approved Stormwater Management Program

The stormwater management program will be approved by the Board of County Commissioners (BOCC) prior to formal submittal to Ecology. The County chose to have the BOCC provide local approval for the program because it includes actions by more than one department and requires decisions on policy and budget issues, associated with implementation of the NPDES stormwater management program.

PERMIT AREA

The NPDES permit area is unincorporated Clark County. Within the unincorparated area of Clark County, all storm sewer systems that are defined by the federal NPDES regulations as municipal separate storm sewers (40 CFR 122.26(b)(8)) will be required to have coverage under the NPDES permit. Drainage districts providing drainage services for any non-agricultural areas will be required to have coverage and perform permit requirements defined by Ecology.

PRIMARY AGENCIES

The Clark County Public Works Department, Environmental Services Division has primary responsibility for administering the NPDES permit program, including completing the Part 2 application. The Clark County Public Works Department operates the municipal storm sewer system, as well as hazardous waste reduction and water quality improvement programs, and will implement most of the stormwater management program elements. The Department of Community Development performs the regulatory program for development activities relating to stormwater management and code enforcement actions.

HOW TO USE THIS DOCUMENT

This document serves two primary functions: 1) it is submitted to Ecology as a requirement for issuance of the NPDES permit and 2) it is for the review by County citizens and BOCC which must approve the program and assure adequate revenue to meet program objectives.

Clark County citizens may be interested in the document as a framework for stormwater management and water resource management programs in Clark County. Approval by the BOCC will involve public review of this document.

Chapter 1 provides background information about the overall report.

Chapter 2 describes stormwater management priorities, existing problems, problem sources, solutions, existing programs, and unmet needs. The prioritization of needs and a description of the method to allocate resources to the highest priority problems is a Ecology requirement. Chapter 2 should be of interest to the public because it examines each basin, listing the problems and evaluating the problems as stormwater management program concern.

Chapter 3 describes the Clark County stormwater management program by program element: regulation, operations and maintenance, monitoring, public involvement and education, and the capital improvements. There is a description of the proposed staff and funding levels for each program element.

Chapter 4 is intended to identify and reference the program elements that meet the specific NPDES permit requirements. Clark County developed this report using the permit requirements for the Puget Sound basin, along with any clarifications and any possible modifications by Ecology for Clark County. Ecology wrote added guidance describing probable permit requirements for Clark County (draft, Wessel, July 1998). The actual permit will be written after submittal of the Part 2 Application. The actions to meet each requirement are presented by either referencing Chapter 3 program element descriptions or providing additional information for a permit requirement.

CHAPTER 2

PROBLEM IDENTIFICATION AND NEEDS ANALYSIS

CONTENTS

BACKGROUND

The permit application requires an assessment of the existing program to determine "needs" and "unmet needs" and to prioritize actions during the first permit term. Unmet needs are simply a stormwater management need that is not addressed by an existing program. The specific requirement is:

> *An analysis of stormwater management needs, a system for prioritizing needs, a description of the basis for the priority system, and an implementation plan and schedule for the term of the permit that reflect the priority needs. The stormwater management program must have an appropriate balance between prevention and correction based upon available information about sources of pollution and discharges from municipal separate storm sewers owned or operated by the permittee.*

The needs assessment provides a guide to the possible level of effort for meeting a permit requirement.

SUMMARY

This section includes problem identification and an analysis and prioritization of stormwater management needs that uses the following process:

- Information Basis - Describe the available information about problems;
- Problem Identification - Identify problems, their sources,
- Existing and Proposed Problem Solutions - Identify solutions and the existing and proposed activities to implement solutions;
- Prioritize Problems - Rate or prioritize problems; and
- Prioritize Program Needs - Identify the highest priorities of County programs such as Operations and Maintenance.

This analysis uses a set of problems that can occur anywhere in the County and a list of solutions that can be applied to each problem as appropriate. Each problem is assigned a rating as a stormwater management concern and the sources of the problem and solutions for the problem are listed. The preliminary list of problems, sources, solutions, current actions and proposed actions is listed in Appendix A.

Review of the problems, possible solutions, and current programs suggested that establishing the foundation for building a stormwater management program was the overriding unmet need. Six main stormwater management priorities are described to guide selection of the action in the stormwater management program. Identifying the many problems associated with stormwater has shown how interdependent stormwater runoff management and protecting aquatic resources are. Clark County's stormwater management program is in an initial phase as a unified process under NPDES permit requirements. A systematic approach to stormwater management is a new activity at the County. Development of overall County priorities to address all of the stormwater problems was not completed at

this early stage in the program. The following stormwater management priorities are established for the first permit term:

- Identify Revenue Sources for Stormwater Management
- Protect Public Safety and Property
- Take Immediate Actions to Prevent Further Water Resource Degradation
- Improve the Information for Making Stormwater Management Decisions
- Involve the Public in Stormwater Management Decision Making
- Educate the Public to Protect Water Resources

The mandatory need for many new actions to meet the basic requirements became an important part of selecting the proposed actions for the NPDES stormwater management program (SWMP). Priority problems influence the level of effort placed on meeting each requirement. In the cases of several permit requirements, little or no new activity is proposed.

Actions for the implemented SWMP are also prioritized to meet program needs. An example is the Operations need to complete storm sewer mapping and establish a comprehensive maintenance tracking program.

METHODOLOGY

The needs and unmet needs assessment attempts to follow the guidance provided by Ecology in the permit requirements for the Puget Sound Basin (requirement S7.B.2). The County found that more than one approach could be followed and opted to follow the Ecology guidance as for an initial analysis, followed by an analysis of the specific needs of the major program elements such as capital improvements and the regulatory program.

Information describing Clark County waters was compiled for review and is listed in a following section.

A set of stormwater management problems, based on analysis from the Puget Sound permittees, are described in the following section. Along with the problem description, there is a preliminary attempt to assign a priority to each problem as a stormwater management concern. Appendix A has a preliminary list of the problems, solutions, current programs and unmet needs.

Each problem was also rated as a management concern by basin or planning area. The results of this preliminary analysis are in Appendix B.

The priorities of each major program element were provided by program managers, and evaluated by comparison to the problems and their management priorities. This produced a list of proposed actions that was reviewed by a work group of individuals invited by the Clark County Board of Commissioners. Meetings were also attended by the public.

The preliminary list of current and proposed actions for the permit term are included in Chapter 3 under their respective major program element.

INFORMATION BASIS

The following list includes the information basis for the problem identification in this section. Descriptive information is presented for each stormwater management problem in the following section. Also, Appendix B has summaries of problems and management priority by basin or planning area.

General or County-Wide Information

- 1998 303(d) List for WRIA 27 and WRIA 28 (Washington Department of Ecology, June 1998)
- 305(b) List, 1995 (Washington Department of Ecology, September 1995)
- Water Quality Management Plan for Clark County, Washington, (Intergovernmental Resource Center, 1987)
- Urban Runoff Study (U.S. EPA, 1988)
- Clark County Water Quantity Monitoring Report (Water Quality Division, 1993)
- Flood Report, Flooding of February 8, 1996 (Water Quality Division, 1996)
- Estimated Recharge (Snyder and others, 1994)
- Groundwater Resources (Mundorff, 1964)
- GIS data for resource and land use features (Clark County Department of Assessment and GIS)

Burnt Bridge Creek Basin

- KCM Water Quality Report (1976)
- Burnt Bridge Creek annual Water Quality Reports from 1980 to 1990 (Burnt Bridge Creek Utility and Southwest Washington Health District data reports)
- Burnt Bridge Creek Water Quality Monitoring Report, 1991 to 1993 (Clark County Water Quality Division, March 1994)
- Burnt Bridge Creek Watershed Plan (Clark County Water Quality Division, November 1995)

Gibbons Creek Basin

- Remnant channel receiving water study (Washington Department of Ecology, April 1996)

Salmon Creek Basin

- Benthic invertebrate, periphyton, water and sediment data (White and McKenzie, U.S.G.S.,1979)
- Cougar Creek Water Quality Survey (Washington Department of Ecology, June 1987)

- Salmon Creek Water Quality Monitoring Report (Southwest Washington Health District, May 1990)
- Curtin Creek Water Quality Baseline Study, Final Report (Sweet-Edwards/EMCON, 1991)
- The Legacy, The Salmon Creek Watershed Management Plan (Clark County Department of Community Development, June 1993)
- Salmon Creek Nonpoint Source Pollution TMDL (Washington Department of Ecology, 1995)
- Salmon Creek Basin Water Resources Management Plan (Clark Public Utilities/Salmon Creek MOU, March 1996b)
- Salmon Creek Basin Monitoring and Management Plan Annual Report 1995 (Clark Public Utilities/Salmon Creek MOU, March 1996a)
- Salmon Creek Basin Monitoring and Management Plan Annual Report 1996 (Clark Public Utilities/Salmon Creek MOU, August 1997)
- Watershed Planning engineering databases and mapping, 1996-1997
- Draft Lakeshore/Salmon Creek Watershed Areas Plan (Clark County Water Quality Division, April 1997)
- Draft Lakeshore/Salmon Creek Watershed Areas Business Plan (Clark County Public Works Department, December 1997)
-

Lakeshore Area

- Unpublished water testing data from 1970's and 1980's (Southwest Washington Health District)
- Clark County Watershed Planning Program engineering databases and mapping, 1996-1997

Lacamas Creek Basin

- Lacamas-Round Lake Diagnostic and Restoration Analysis, Final Report (Intergovernmental Resource Center, July 1985)
- Lacamas Lake Restoration Project Water Quality Monitoring 1991 to 1992 Progress Report (Clark County Water Quality Division, 1994)
- Lacamas Lake Watershed 1995 Water Quality Monitoring Program (E&S Environmental Chemistry, Inc., April 1996)
- TMDL Evaluation (Washington Department of Ecology, March 1996)
- Lacamas Lake Watershed 1996 Water Quality Monitoring Program (E&S Environmental Chemistry, Inc., June 1997)
- Lacamas Lake Watershed Restoration Project Program Review (E&S Environmental Chemistry, Inc., April 1998)

East Fork Lewis River Basin

- East Fork Lewis River Action Plan for Nonpoint Pollution (Clark County Water Quality Division, August 1995)
- East Fork Lewis River Land Use and Water Quality Background Report (Clark County Water Quality Division, August 1995)

- East Fork Lewis River Water Quality Assessment Background Report (Clark County Water Quality Division, August 1995)
- East Fork Lewis River Watershed Characterization Background Report (Clark County Water Quality Division, August 1995)

Groundwater

- Quality of Groundwater in Clark County, Washington, 1988 (Turney, U.S.G.S, 1990)
- Groundwater Management Plan for Clark County, Washington (Clark County Groundwater Advisory Committee, December 1992)
- Method to Evaluate Aquifer Vulnerability Through Conjunctive Use of a Groundwater Flow Model and a Geographic Information System (Clark County Water Quality Division, January, 1994)
- Drywell Management Program Groundwater Quality Evaluation (Swanson, March 1995)

Impaired Water Bodies, 1998 303(d) Listings

The following table lists the water bodies in Clark County that receive discharges from the County storm sewer system or County roadside ditches. The 303(d) list describes water quality and includes a TMDL where water bodies do not meet state standards. Ecology is mandated to do this by federal law. The 305(b) listing is also mandated of Ecology by federal law. It describes the beneficial use loss of Washington water bodies and the general causes of the beneficial use loss. The most recent 305(b) report that references specific streams was completed in 1995.

Receiving Water Body Listings

Watershed	Receiving Bodies	1998 303(d)	305(b) Impaired Uses (1995)	303(d) Action, 1998
North Fork Lewis River	North Fork Lewis River		Salmonid spawning	
	Cedar Creek		Salmonid spawning	
	Pup Creek			
	Canyon Creek			
East Fork Lewis River	East Fork below Moulton	F.C., Temp.	Pr. Con. rec., Fish habitat, Sal. spawning	TMDL
	East Fork above Moulton	F.C.	Salmonid spawning	TMDL
	Jenny Creek			
	McCormick Creek	F.C., Temp	Primary contact rec., Salmonid spawning	TMDL
	Lockwood Creek	F.C.	Primary contact rec., Salmonid spawning	TMDL
	Riley Creek			
	Mason Creek			
	Rock Creek	F.C.	Primary contact rec., Salmonid spawning	TMDL
	Yacolt Creek	F.C.		TMDL
	Allen Canyon Creek			
	Gee Creek			
Lake River	Lake R. below Salmon Cr	F.C., Temp., Sed.	Pr. Con. rec., Sec. con. rec., Fish habitat, Sal. Spawning, Fish migration	TMDL, other control
	Flume Creek			
	Whipple Creek			
	Packard Creek			
	Salmon Creek	F.C., Temp. Turb.	Primary contact rec., Salmonid spawning	TMDL
	Cougar Creek	D.O.	Primary contact rec., Salmonid spawning	TMDL
	Mill Creek	F.C.	Primary contact rec., Salmonid spawning	TMDL
	Curtin Creek	F.C.	Primary contact rec., Salmonid spawning	TMDL
	Woodin (Weaver) Creek	F.C.	Primary contact rec., Salmonid spawning	TMDL
	Morgan Creek			
	Mud Creek			
	Burnt Bridge Creek	D.O, F.C., Temp.	Pr. Con. rec., Fish habitat, Sal. Spawning	TMDL
	Cold Creek			

Watershed	Receiving Bodies	1998 303(d)	305(b) Impaired Uses (1995)	303(d) Action, 1998
	Vancouver Lake		Aesthetic enjoyment	
Columbia Slope	Biddle Lake Fisher Creek			
Washougal River	Washougal River Little Washougal River Cougar Creek Winkler Creek Boulder Creek Jones Creek		Salmonid spawning	
Lacamas Creek	Lacamas Lake Lacamas Creek Fifth Plain Creek Shanghai Creek Matney Creek China Ditch	 D.O, F.C., pH, Temp. D.O, pH, Temp. D.O., pH, Temp., D.O, pH, Temp. D.O, Temp.	Aesthetic enjoyment Pr. Con. rec., Fish habitat, Sal. Spawning Fish habitat, Salmonid spawning Fish habitat, Salmonid spawning Fish habitat, Salmonid spawning Salmonid spawning	 TMDL TMDL TMDL TMDL TMDL
Gibbons Creek	Gibbons Creek Campen Creek	F.C.	Primary contact rec., Secondary cont. rec.	TMDL
Lawton Creek	Lawton Creek			

D.O. = dissolved oxygen, F.C. = fecal coliform bacteria, Temp. = temperature, TMDL = establish a total maximum daily load

1998 305(b) Report for the Clark County Region

Use	Percent Good	Percent Fair	Percent Poor
Overall use support of assessed streams	14	50	36
Overall use support of assessed lakes	3	90	6
Aquatic life use support of assessed streams	56	36	8
Fish migration use support of assessed streams	78	22	0
Fish spawning use support of assessed streams	78	22	0
Salmonid spawning use support of assessed streams	56	36	8
Primary contact recreation use support of assessed streams	36	28	36
Secondary contact recreation use support of assessed streams	50	22	28
Aesthetic enjoyment use support of assessed lakes	3	90	6

PROBLEMS, SOURCES, AND MANAGEMENT PRIORITIES

INTRODUCTION

This section describes the effort to prioritize problems and lay the basis for selecting a set of proposed actions for the first NPDES permit term. It is not a final analysis but a first effort that should be refined by added information and results from public involvement during the permit term.

Established priorities provide the criteria for determining choices regarding the allocation of funds and staff to satisfy stormwater management needs. Those priorities are considered in determining whether a problem is a management priority. Water resource management and stormwater management priorities are set by County programs. They are largely reported here.

RESULTS OF STORMWATER PROBLEM ASSESSMENT

High Priority County-Wide Problems

High priority county-wide problems are high rated management concerns from a preliminary analysis. Aside from localized flooding, the high priority problems form an interdependent web of cause and result. For example, excess storm flows are a cause of lost and degraded riparian habitat, while lost and degraded habitat are a cause of excess temperatures. The following list of high-rated management concerns are not ranked against each other:

- Localized Flooding;
- Excess Storm Flows;
- Excess Temperatures in Surface Water
- Excess Bacteria in Surface Water;
- Low Dissolved Oxygen in Surface Water;
- Metals and Organic Pollutants in Stormwater;
- Excess Sediment in Stream Beds;
- Lost and Degraded Riparian Habitat; and
- Loss of Wetlands.

STORMWATER MANAGEMENT PRIORITIES – SUMMARY AND CONCLUSIONS

Identifying the many problems associated with stormwater has shown how interdependent stormwater runoff management and protecting aquatic resources are. Clark County's stormwater management program is in an initial phase as a unified process under NPDES permit requirements. A systematic approach to stormwater management is a new activity at the County. Development of overall County priorities to address all of the stormwater problems was not completed at this early stage in the program. Several priorities did guide selection of the actions listed in Chapter 3. Priorities are described here and are not in any particular order.

The Stormwater Management Program is going to evolve and change during the permit term. Part of the program will be to set out clear priorities for the next permit term and for implementing new actions during the permit term.

Identify Revenue Sources for Stormwater Management

Current actions are performed to meet ongoing obligations to provide a level of service, protect the public, protect the environment, or follow regulatory requirements. Most of the current actions are part of a baseline stormwater management program that meet Clean Water Act requirements or the County's obligations to manage storm water runoff. Some current actions are one-time projects using a specific and limited source of funds. Since there is no place to cut current programs to fund new stormwater management actions, a new source of revenue is needed to fund increased stormwater management.

Protect Public Safety and Property

Protecting public safety and property from damage due to stormwater runoff and flooding is a stormwater management goal. The Regulatory Program Element, Operations Program Element and Capital Improvement Program Element all contain current and several proposed actions to protect the public from stormwater runoff and flooding.

Take Immediate Actions to Prevent Further Water Resource Degradation

Certain immediate or short-term actions can be taken to reduce the damage done to aquatic habitat by land development and current activities. Capital projects to mitigate for existing stormwater problems are very costly and difficult to quickly implement. Short-term actions include regulating stormwater controls for land development, increasing storm sewer maintenance, increasing education and increasing inspection and enforcement.

Improve the Information for Making Stormwater Management Decisions

The outcome of stormwater management decisions can influence activities throughout the county. Expenditures for stormwater management are expected to increase due to the need to protect fish habitat and eventually meet state water quality standards. Sound stormwater management decisions require good information about current conditions and the ability to reasonably predict the outcome of stormwater management options. Improving and expanding the monitoring and evaluation program is necessary to do this.

Involve the Public in Stormwater Management Decision Making

In order to make policy choices that are acceptable to the community, public involvement and outreach processes are used to develop ordinances and shape new programs such as a capital improvement program, and funding options.

Educate the Public to Protect Water Resources

Non-point pollution prevention and habitat protection can not be performed without an educated public. The Stormwater Management Program includes increased education to meet this priority.

PRIORITY SETTING METHOD

Priorities are drawn from individual programs such as the unadopted Lakeshore/Salmon Creek watershed plan and the Burnt Bridge Creek Utility. In areas where no specific program goals are in place, general county-wide goals are proposed.

NPDES Stormwater Management Program Goal

The stormwater management program goal is to establish a framework for meeting the goals of the Clean Water Act, namely to provide for the propagation of fish and wildlife, and provide for recreational uses. In additional to the Clean Water Act, Clark County also intends to protect groundwater supplies from pollutant discharges to the subsurface by storm sewers.

Detailed Guidance From the Department of Ecology

The Department of Ecology provided detailed guidance to Puget Sound permittees. This guidance also applies to the development of the Clark County stormwater management program. The guidance is listed below *in italics:*

Needs and Prioritization Detailed Guidance

The following criteria are listed as guiding the selection of needs and prioritization of solutions:

- *Balance of preventative and corrective programs*
- *Priority on source controls*
- *Cost-effectiveness as a criterion for prioritization*
- *Consideration of community values*
- *SWMPs are expected to evolve throughout the permit period.*

Salmon Creek and Lakeshore Planning Goals

In December 1997 Clark County released the draft plan for establishing a program to better manage water resources in Salmon Creek basin and the Lakeshore planning area. The plan is not adopted as of this date. It was intended to expand on the drainage capital improvement program, storm sewer maintenance, and other activities to improve storm sewer service, and to improve Salmon Creek and its tributaries for wildlife and fish habitat and for recreation. The Plan was reviewed by a committee appointed by the Clark County Board of Commissioners and public testimony was accepted.

Burnt Bridge Creek Utility Priorities

Burnt Bridge Creek Utility priorities are restricted by the low rate of the utility $1.75 per month per 2,500 square feet of impervious area. Utility priorities are to:

- Provide adequate stormwater drainage to prevent flooding and
- Perform drainage system maintenance.

Priorities for All Areas

Stormwater management program activities in areas outside of utility service areas should be prioritized to meet two long term goals:

- Preserve and enhance beneficial uses of surface water and groundwater and
- Protect public safety and property from flooding.

Problem Prioritization as a Management Concern

Each problem is assigned a management concern rating. The management concern rating reflects the degree to which the problem is of immediate concern for watershed management. The management concern rating reflects several criteria including whether the problem needs to be addressed under stormwater management program priorities.

Management concern ratings were devised to attempt to provide a preliminary screening tool for each basin. This process was completed and is briefly described later in this Chapter and in Appendix B.

Another way of looking at the management concern rating is to consider it a measure of the need for immediate action to mitigate or prevent further degradation due to the problem. Generally, a high rating (H) implies that the problem needs to be addressed soon to stop loss of, or to rehabilitate the beneficial uses of a water body. A high rating can also be applied to protecting an exceptional resource such as a Class AA stream. Moderate (M) suggests that the problem may not benefit from immediate action but should be considered as a part of the program if funds are available. A low (L) suggests that immediate action is will not have a significant result or that there may be no feasible solution. Stream classification is found in Chapter 173-201A WAC.

High management concern rating criteria include:
- Immediate action is required to prevent loss or degradation of a beneficial use due to the problem;
- Immediate action is required to solve a property loss or public safety problem;
- Action is required to protect an exceptional water body such as a Class AA river;
- It is likely action will have an influence during the next five years; or
- Action is required to meet the stormwater management program priorities.

Moderate management concern rating criteria include:
- Action may lessen a beneficial use loss;
- A current beneficial use may be threatened in the next five years;
- Action may be required within the next five years to solve or address the problem;
- Action may have an influence during the next five years; or

Low management concern rating criteria include:
- A beneficial use is not threatened by the problem;
- The problem is a not stormwater management priority; or
- Action is unlikely to influence the problem within five years.

WATER QUALITY PROBLEMS AND MANAGEMENT PRIORITIES

This section describes the relative county-wide management priority for a set of generic stormwater management problems. A preliminary listing of the problems, their sources, and current and proposed actions to address the problems are included in Appendix A.

Urban Water Bodies

Water bodies receiving runoff from urban or urbanizing areas are described as "urban water bodies". These are chiefly streams tributary to Burnt Bridge Creek, Salmon Creek, and Lake River in the unincorporated Vancouver urban area, along with several tributaries to Lake River in urbanizing areas along Interstate Highway 5 between Salmon Creek and the Lewis River. Wetlands in urban areas are usually drained, filled or severely degraded.

The water resource problems for urban streams are typical of streams in areas where natural woods, grass fields, and wetlands have been converted to impervious area. Problems include loss of riparian habitat, eroded channels, high turbidity, excess sediment loads, and high fecal coliform concentrations that do not meet Class A stream quality standards. Current County programs addressing these problems focus on development regulations, attempting to establish a funding mechanism for stormwater capital improvements, and performing small capital projects to correct specific drainage problems.

Rural Water Bodies

Rural water bodies include the East Fork Lewis River, Lewis River, Washougal River, much of Lacamas Creek basin, rural areas of Salmon Creek, and rural parts of smaller tributaries to Lake River and the Columbia River. Wetlands are found throughout rural parts of Clark County.

Problems in rural areas tend to be associated with agricultural runoff, riparian habitat destruction, past forest and wetland conversion for agriculture, forestry, and increasing rural residential development. Protecting rural water bodies requires a different set of priorities and actions than urban water bodies. In rural areas, runoff controls are limited to maintaining and improving ditches along roads, road culverts, and bridges. Runoff from new development and other regulated land disturbing activities are controlled through regulatory programs. Outreach programs for agricultural practices are in place in Lacamas Creek basin and the East Fork Lewis River basin.

Groundwater

Groundwater from relatively shallow aquifers supplies almost all of the water for domestic, industrial, agricultural and commercial use Clark County. Groundwater is also the source for stream base flow, many seasonal wetlands, all perennial wetlands and ponds, and all seasonal and perennial springs.

In some parts of the urban area, stormwater discharged to drywells and drainage trenches provides a large part of the groundwater recharge. Concern about groundwater quality degradation is greatest in areas where stormwater is collected and drained to infiltration structures. The incomplete use of pollutant source control measures and stormwater treatment are a serious concern for infiltrated runoff from roads, businesses, and parking lots. Areas of greatest concern for untreated stormwater infiltration have been mapped using features such as shallow groundwater, land use and proximity to public supply wells. Current programs focus on the use of development regulations to limit the amount of pollutants entering storm sewers, development of a drywell management program, and public outreach to businesses for better waste management.

The attached Clark County Map outlines major basin boundaries and projected land use from the Comprehensive Plan.

Localized Road and Property Flooding

Localized flooding is a common problem in many parts of the County. It is not due to rivers leaving their banks, but to a host of interacting conditions that result in poorly drained areas where roads, streets, yards and sometimes buildings are periodically flooded. Localized flooding is documented by recording and investigating public complaints to the Public Works Department and through observations by road crews. Chapter 13.25, Subsection 220(4) CCC describes standards for flood drainage. The 10-year design storm design standard for street flooding for new development is that less than one half roadway be ponded and that flow depth shall not be greater than 0.12 inch at the edge of the travel lane. For 100 year storms, one travel lane in each direction have flow depth no greater than 0.5 feet. There are also requirements that properties be graded to drain away from structures and other property in all rainfall conditions. These standards have not always been met for existing storm sewers. A county-wide assessment of drainage problems is underway to prioritize several hundred urban and rural drainage problems and produce cost estimates to fix them.

The stormwater management goal is to assure that new construction is not subject to flooding, does not cause groundwater flooding to encroach on existing structures or property, and is not subject to crawl space flooding. Existing problems are extremely difficult to solve without digging very deep gravity drain pipe systems or causing additional downstream problems. Legal issues associated with the creation of new drainage problems outside the flooded area limits the use of interbasin water transfer to drain local topographic depressions.

Insert 11x17 map figure here

Localized Flooding Management Priority

Due to a need to protect property and prevent road flooding, management priority for localized flooding is high.

High management concern, rating criteria include:

No	Immediate action is required to prevent loss of a beneficial use due to the problem;
No	Action is required to protect an exceptional water body such as a Class AA river;
Yes	Immediate action is required to solve a property loss or public safety problem;
Yes	Action will be likely to have an influence during the next five years; or
Yes	Action is required to meet the stormwater management program priorities.

Moderate management concern, rating criteria include:

No	A beneficial use loss would be lessened by the action;
No	A current beneficial use may be threatened in the next five years;
Yes	Action may be required within the next five years to solve or address the problem;
Yes	Action may have an influence during the next five years; or

Low management concern, rating criteria include:

Yes	A beneficial use is not threatened by the problem;
No	The problem is not necessary to address as a stormwater management program priority; or
No	Action is unlikely to influence the problem within five years.

Regional Flooding

Regional flooding occurs when larger streams and rivers leave their channels and inundate their flood plains. The hazard is controlled largely by development regulations for activities in flood plains, occasional capital projects to build dikes protecting flood plain property, programs to promote retention of open space on flood plains, and the purchase flood plain property for conservation.

Regional Flooding Management Priority

Regional flooding management priority is moderate because few Clark County rivers have significantly sized flood plains. Areas of high priority include the lower Lewis River and parts of the Washougal River basin.

Excess Storm Flows

Excess storm flows are caused by uncontrolled or inadequately controlled runoff from roads, roofs, and paved areas. Uncontrolled runoff causes streams to erode and incise their channels, destroying habitat and causing property loss. Eroded sediment also covers aquatic habitat, smothering creatures that live in gravel substrate and destroying fish spawning beds. Excess storm flows include increased peak flows and longer duration of flows that can erode stream beds and remove channel habitat.

Regional Flooding Management Priority

High management concern, rating criteria include:
N Immediate action is required to prevent loss of a beneficial use due to the problem;
N Action is required to protect an exceptional water body such as a Class AA river;
N Immediate action is required to solve a property loss or public safety problem;
Y Action will be likely to have an influence during the next five years; or
N Action is required to meet the stormwater management program priorities.
Moderate management concern rating criteria include:
N A beneficial use loss would be lessened by the action;
N A current beneficial use may be threatened in the next five years;
N Action may be required within the next five years to solve or address the problem; or
Y Action may have an influence during the next five years;
Low management concern rating criteria include:
Y A beneficial use is not threatened by the problem;
N The problem is not necessary to address as a stormwater management program priority; or
Y Action is unlikely to influence the problem within five years.

Excess storm flow problems are identified by published reports and Ecology as the main cause of beneficial use loss due to stormwater runoff. Locally, field observations by County staff have identified the results of excess storm flows on streams. Streams in areas having uncontrolled stormwater runoff are assumed to have excess storm flows; this includes all urbanized stream basins and most of the developing stream basins. In the Puget Sound Lowlands, May (1996) found a direct correlation between suburban or urban development and streams that were severely degraded.

Excess Storm Flows Management Priority

Due to the widespread loss of aquatic habitat due to excess storm flows from existing and proposed development, there is high priority for actions to control or begin to reverse damage to streams by uncontrolled urban runoff.

High management concern rating criteria include:
Y Immediate action is required to prevent loss of a beneficial use due to the problem;
N Action is required to protect an exceptional water body such as a Class AA river;
N Immediate action is required to solve a property loss or public safety problem;
Y Action will be likely to have an influence during the next five years; or
Y Action is required to meet the stormwater management program priorities.
Moderate management concern rating criteria include:
Y A beneficial use loss would be lessened by the action;
Y A current beneficial use may be threatened in the next five years;
Y Action may be required within the next five years to solve or address the problem; or
Y Action may have an influence during the next five years;
Low management concern rating criteria include:
N A beneficial use is not threatened by the problem;
N The problem is not necessary to address as a stormwater management program priority; or
N Action is unlikely to influence the problem within five years.

High Temperatures in Surface Water

Aquatic creatures have specific temperature ranges in which they thrive. There are also limits on the water temperatures that they can survive in. Aquatic organisms need certain levels of dissolved oxygen to survive. The amount of dissolved oxygen in water depends to a large part on water temperature; higher temperatures result in lower dissolved oxygen concentrations. Trout and salmon, and their food sources, require lower temperatures than most other fish. Anything that warms stream water makes it less likely that there will be healthy fish.

Typical human-caused increases in temperature result from removal of riparian shading, runoff from pavement and roofs, and ponds or stormwater control ponds. A study in Maryland (Galli, 1991), cited by Horner and others (1994) concluded that air temperature had the strongest influence on water temperature. The study also found that average temperature increased with increasing amounts of impervious area. Temperature violations began to occur at 12 percent impervious area and increase in severity and number as impervious area increased. The Maryland report also found that stormwater treatment facilities tended to increase water temperatures and that this effect should be considered in design.

Efforts to mitigate high temperatures involve restoring or protecting streamside shading. Stormwater facilities should be constructed "off-line" to minimize warming base flow in ponds. Proposed state standards for temperature include a process to set a temperature standard for each waterbody. A particular temperature category would be applied to a water body based on the type of aquatic life that inhabit the water body or for which it is naturally suited.

High Temperature in Surface Water Management Priority

The direct link between temperature and stream habitat health leads to a high management priority for water temperatures. The ability to add stream-side shade for relatively low cost also leads to feasible solutions for excess temperatures.

High management concern rating criteria include:

Y	Immediate action is required to prevent loss of a beneficial use due to the problem;
Y	Action is required to protect an exceptional water body such as a Class AA river;
N	Immediate action is required to solve a property loss or public safety problem;
Y	Action will be likely to have an influence during the next five years; or
Y	Action is required to meet the stormwater management program priorities.

Moderate management concern rating criteria include:

Y	A beneficial use loss would be lessened by the action;
Y	A current beneficial use may be threatened in the next five years;
Y	Action may be required within the next five years to solve or address the problem; or
Y	Action may have an influence during the next five years;

Low management concern rating criteria include:

N	A beneficial use is not threatened by the problem;
N	The problem is not necessary to address as a stormwater management program priority; or
N	Action is unlikely to influence the problem within five years.

Excess Bacteria in Surface Water

Urban runoff and urban streams often fail to meet standards for fecal coliform bacteria. Turbid waters from rural areas also have high coliform bacteria content due to bacteria in soils being washed into streams and animal wastes directly deposited in streams or washed into streams. There are many sources of fecal coliform in urban runoff and in urban streams. A recent study of Burnt Bridge Creek (Samadpour and Addey, September 1997) using DNA finger printing of E. coli bacteria samples, found that the most common bacteria source was humans. Presumed sources include septic systems and direct or indirect sewage connections to the creek.

Bacteria concentrations are usually much lower when streams are at base flow and many times higher during storms. High bacteria counts for warm weather base flow probably signify the greatest risk for human contact. Ecology is considering changing the standard for recreational use from fecal coliform to the more specific indicators such as E. coli bacteria or enterocci virus which are linked more directly to disease outbreaks in swimmers. The current Class A (excellent) stream standard for recreational use such as swimming and wading is a geometric mean of less than 100 organisms/100 ml. Class AA standard for extraordinary waters is a geometric mean of less than 50 organisms/100 ml (Chapter 173-201 WAC). The Class B (good) standard of 200 organisms/100 ml is acceptable for use by wildlife and for salmonid production. The Lake class is equal to the Class AA stream standard.

Excess Bacteria in Surface Water Management Priority

Pathogenic organisms pose a high management priority for urban streams due to possible human contact with water that contains sewage. This applies only to stream flows that are not stormwater runoff. It is feasible to identify and eliminate direct sources of sewage to storm sewers and urban streams. Reducing or eliminating pathogenic organisms in stormwater runoff to a point where there would be an improvement in stream quality is not likely to be feasible.

High management concern rating criteria include:

Y	Immediate action is required to prevent loss of a beneficial use due to the problem;
N	Action is required to protect an exceptional water body such as a Class AA river;
N	Immediate action is required to solve a property loss or public safety problem;
Y	Action will be likely to have an influence during the next five years; or
Y	Action is required to meet the stormwater management program priorities.

Moderate management concern rating criteria include:

Y	A beneficial use loss would be lessened by the action;
N	A current beneficial use may be threatened in the next five years;
Y	Action may be required within the next five years to solve or address the problem; or
Y	Action may have an influence during the next five years;

Low management concern rating criteria include:

N	A beneficial use is not threatened by the problem;
N	The problem is not necessary to address as a stormwater management program priority; or
N	Action is unlikely to influence the problem within five years.

Excess Nutrients in Surface Water

Excess nutrients, usually nitrogen and phosphorus, can cause an unacceptable increase in aquatic plant and algae growth. Excessive plant and algae growth can be associated with excessively low dissolved oxygen. Aquatic organisms require certain levels of dissolved oxygen to thrive and survive. The greatest problems arise when excess nutrients occur in lakes (Lacamas Lake) or slow moving rivers such as Lake River. Controllable sources include eroded sediment, livestock waste, and chemical fertilizers. Water quality standards do not exist for nutrients, but less is better.

Excess Nutrients in Surface Water Management Priority

Excess nutrients are overall a moderate priority; locally however excess nutrients are a high management priority. Specific problem areas include Lacamas Creek and possibly streams draining to Lake River.

High management concern rating criteria include:

N	Immediate action is required to prevent loss of a beneficial use due to the problem;
N	Action is required to protect an exceptional water body such as a Class AA river;
N	Immediate action is required to solve a property loss or public safety problem;
Y	Action will be likely to have an influence during the next five years; or
N	Action is required to meet the stormwater management program priorities.

Moderate management concern rating criteria include:

Y	A beneficial use loss would be lessened by the action;
N	A current beneficial use may be threatened in the next five years;
N	Action may be required within the next five years to solve or address the problem; or
Y	Action may have an influence during the next five years;

Low management concern rating criteria include:

N	A beneficial use is not threatened by the problem;
N	The problem is not necessary to address as a stormwater management program priority; or
N	Action is unlikely to influence the problem within five years.

Low Dissolved Oxygen in Surface Water

Low dissolved oxygen is a result of problems caused by excess nutrients which are also directly linked to high water temperatures. Low dissolved oxygen can stress or kill organisms that live in streams and lakes. Standards are described for Class A and AA streams and lakes in WAC Chapter 173-201.

Low Dissolved Oxygen in Surface Water Management Priority

The direct influence that low dissolved oxygen has on aquatic life makes it a high priority for streams influenced by urbanization, agriculture, or forestry. Information describing the extent of this problem is poor. Solutions that protect and enhance riparian habitat apply.

High management concern rating criteria include:

Y	Immediate action is required to prevent loss of a beneficial use due to the problem;
N	Action is required to protect an exceptional water body such as a Class AA river;
N	Immediate action is required to solve a property loss or public safety problem;
Y	Action will be likely to have an influence during the next five years; or
Y	Action is required to meet the stormwater management program priorities.

Moderate management concern rating criteria include:

Y	A beneficial use loss would be lessened by the action;
N	A current beneficial use may be threatened in the next five years;
Y	Action may be required within the next five years to solve or address the problem; or
Y	Action may have an influence during the next five years;

Low management concern rating criteria include:

N	A beneficial use is not threatened by the problem;
N	The problem is not necessary to address as a stormwater management program priority; or
N	Action is unlikely to influence the problem within five years.

Metals and Organic Pollutants in Surface Water and Groundwater

Metals occur in nature but are found at elevated concentrations in stormwater runoff from roads and commercial areas. Concentrated metals enter stormwater due to poor source control where materials are stored, handled or spilled. Vehicle maintenance or repair areas, industrial sites, and outdoor work areas are possible pollutant sources. Surface water quality standards for metals are complex, but it is desirable to control pollutant sources to stormwater runoff. Organic pollutants include petroleum products from road runoff and other less common synthetic compounds that are washed from commercial and industrial areas. Some standards exist for toxins.

Dissolved and particulate metals carried by stormwater enter groundwater via stormwater infiltration devices. Causes and sources are the same as metals in stormwater. Limited data exist for this problem. Generally, organic pollutants are associated with road runoff or volatile compounds that are from individual point sources such as solvent disposal to a septic system or the ground. Volatile organic compounds are commonly found in trace amounts in groundwater in urban areas, while other organic compounds are more likely to be trapped in soils. Groundwater standards for metals and other pollutants are included in the Washington groundwater quality standards (WAC 173-200).

Metals and Pollutants Management Priority

Management priority for metals and pollutants is moderate to high. Two approaches are feasible for controlling pollutants. For existing development, pollutants can be controlled by source control practices that prevent pollutants from entering storm sewers. New development addresses stormwater pollution by requiring treatment and source controls.

High management concern rating criteria include:

N	Immediate action is required to prevent loss of a beneficial use due to the problem;
N	Action is required to protect an exceptional water body such as a Class AA river;
N	Immediate action is required to solve a property loss or public safety problem;
Y	Action will be likely to have an influence during the next five years; or
Y	Action is required to meet the stormwater management program priorities.

Moderate management concern rating criteria include:

Y	A beneficial use loss would be lessened by the action;
N	A current beneficial use may be threatened in the next five years;
Y	Action may be required within the next five years to solve or address the problem; or
Y	Action may have an influence during the next five years;

Low management concern rating criteria include:

N	A beneficial use is not threatened by the problem;
N	The problem is not necessary to address as a stormwater management program priority; or
N	Action is unlikely to influence the problem within five years.

Contaminated Sediment in Stream Beds and Lakes

Contaminated sediment is often associated with poor source control and waste disposal at older industrial facilities. Fine grained sediment from urban runoff contains higher amounts of metals and organic pollutants than natural soils. Contaminated sediment can limit the diversity of bottom dwelling organisms in streams and lakes. Contaminants in sediments can re-enter the water column and make water unsafe for swimming, fishing, and drinking.

Contaminated sediment is not likely to be a large problem in Clark County due the lack of large industrial zones. Little information exists to evaluate whether contaminated sediment is a significant issue for beneficial use loss in the permit area; however, metals and organic chemical data for catch basin sediment suggests that there are metals concentrations several times higher than native soils. Water bodies, such as lowermost Burnt Bridge Creek, where sediment from urban runoff accumulates could be most influenced.

Contaminated Sediment Management Priority

Management priority for contaminated sediment is relatively low to uncertain. Unincorporated Clark County lacks extensive industrial areas that are the typical source of contaminated sediment. Little or no information exists to describe the presence or absence of contaminated sediment.

High management concern rating criteria include:

N	Immediate action is required to prevent loss of a beneficial use due to the problem;
N	Action is required to protect an exceptional water body such as a Class AA river;
N	Immediate action is required to solve a property loss or public safety problem;
?	Action will be likely to have an influence during the next five years; or
N	Action is required to meet the stormwater management program priorities.

Moderate management concern rating criteria include:

N	A beneficial use loss would be lessened by the action;
N	A current beneficial use may be threatened in the next five years;
N	Action may be required within the next five years to solve or address the problem; or
?	Action may have an influence during the next five years;

Low management concern rating criteria include:

?	A beneficial use is not threatened by the problem;

N The problem is not necessary to address as a stormwater management program priority; or
Y Action is unlikely to influence the problem within five years.

Excess Sediment in Stream Beds

Sediment washed from construction sites, fields and cleared forests covers stream beds and destroys habitat. Erosion due to excessive storm flows can also remove stream bank material and cover downstream channel beds. Excessive storm flows are addressed separately from excess sediment resulting from land disturbing activities.

Excess Sediment Management Priority

As is the case with excess storm flows and temperature, excess sediment has a direct influence on stream habitat. Controlling excess sediment provides a direct benefit and is a high management priority.

High management concern rating criteria include:
Y Immediate action is required to prevent loss of a beneficial use due to the problem;
N Action is required to protect an exceptional water body such as a Class AA river;
N Immediate action is required to solve a property loss or public safety problem;
Y Action will be likely to have an influence during the next five years; or
Y Action is required to meet the stormwater management program priorities.
Moderate management concern rating criteria include:
Y A beneficial use loss would be lessened by the action;
Y A current beneficial use may be threatened in the next five years;
Y Action may be required within the next five years to solve or address the problem; or
Y Action may have an influence during the next five years;
Low management concern rating criteria include:
N A beneficial use is not threatened by the problem;
N The problem is not necessary to address as a stormwater management program priority; or
N Action is unlikely to influence the problem within five years.

Lost and Degraded Riparian Habitat

Riparian and wetland habitat have been steadily lost to agricultural and urbanization since development began in the early 1800s. The absence of stable riparian habitat, the loss of wetlands, and the loss of areas in flood plains which store flood waters further promotes stream degradation by excess storm flows from urbanization, farming, and forest clearing. Loss of stream-side shade allows water in small to medium size streams to heat to levels that are harmful or fatal to aquatic organisms. Excess storm flows are addressed separately.

Riparian habitat was described for large parts of Salmon Creek by Harvester and Willie (unpublished field notes 1988 and 1989), but no maps are available. Clark County streams and water bodies are mapped by the Washington Department of Natural Resources.

Riparian Habitat Loss Management Priority

Due to the direct relationship between water quality and good quality riparian areas, riparian habitat protection is a high priority. Protecting good quality habitat

should be a priority. Rehabilitating degraded riparian habitat should also be a priority.

High management concern rating criteria include:
Y Immediate action is required to prevent loss of a beneficial use due to the problem;
Y Action is required to protect an exceptional water body such as a Class AA river;
N Immediate action is required to solve a property loss or public safety problem;
Y Action will be likely to have an influence during the next five years; or
Y Action is required to meet the stormwater management program priorities.
Moderate management concern rating criteria include:
Y A beneficial use loss would be lessened by the action;
Y A current beneficial use may be threatened in the next five years;
Y Action may be required within the next five years to solve or address the problem; or
Y Action may have an influence during the next five years;
Low management concern rating criteria include:
N A beneficial use is not threatened by the problem;
N The problem is not necessary to address as a stormwater management program priority; or
N Action is unlikely to influence the problem within five years.

Loss of Wetlands

Wetlands are areas where the ground is seasonally or continuously saturated with water. They are a critical hydrological and ecological component of every watershed. Many wetlands have been drained by ditching or filled to make land available for farming and urbanization. No detailed county-wide wetland inventory exists. Existing wetlands were mapped by the County at a reconnaissance level using scales of approximately 1" = 800 'in Burnt Bridge Creek basin, Salmon Creek basin, and Lakeshore basin. All of the County is covered by the 1" = 2,000 'scale national wetlands inventory maps. Predevelopment wetlands are often inferred from the Washington Department of Natural Resources and the National Resource Conservation Service soil unit maps.

The goal of the County Wetland Protection Ordinance is to further the goal of no net loss of wetland acreage and functions while limiting regulatory applicability to actions that impact important wetlands.

Wetland Loss Management Priority

Wetlands are a critical requirement for a healthy watershed and have a high priority for protection and rehabilitation. Protection through regulation is the principal method. Other methods of protection and enhancement are a goal.

High management concern rating criteria include:
Y Immediate action is required to prevent loss of a beneficial use due to the problem;
N Action is required to protect an exceptional water body such as a Class AA river;
N Immediate action is required to solve a property loss or public safety problem;
Y Action will be likely to have an influence during the next five years; or
Y Action is required to meet the stormwater management program priorities.
Moderate management concern rating criteria include:
Y A beneficial use loss would be lessened by the action;
Y A current beneficial use may be threatened in the next five years;
Y Action may be required within the next five years to solve or address the problem; or
Y Action may have an influence during the next five years;
Low management concern rating criteria include:

- A beneficial use is not threatened by the problem;
- The problem is not necessary to address as a stormwater management program priority; or
- Action is unlikely to influence the problem within five years.

Localized Groundwater Flooding

Localized groundwater flooding periodically occurs in low-lying areas where the water table may seasonally rise to near land surface or forms ponds. It only becomes a problem when buildings or roads are affected. Generally, the result is flooded crawl spaces and inundation of yards, and less frequently, roads and buildings are flooded. The problem appears to be caused in part by accelerated construction in marginally drained low-lying areas during an extended dry period between the mid 1980s and mid 1990s. These areas have become susceptible to groundwater flooding due to a return to wetter weather.

Localized Groundwater Flooding Management Priority

Localized groundwater flooding is sometimes a management priority when buildings and roads are affected. Solutions are often costly, partially effective and can shift drainage problems elsewhere. Often addressing these problems results in a conflict with the protection of streams. Solutions generally attempt to address the most serious problems and attempt to prevent new problems from occuring.

Lost Recharge

Groundwater recharge is lost when land is developed and rainfall infiltration is converted to stormwater runoff. Another source of lost recharge is groundwater infiltration into storm sewers where there is very shallow groundwater. Problems include lowered water table, diminished wetland areas, decreased stream base flow, and decreased flow from springs. Decreased stream base flow is an important factor for loss of habitat for aquatic wildlife. In many parts of Clark County, much of the stormwater runoff is infiltrated by being routed into yards, roadside ditches, drywells, and drainage trenches.

A simplistic standard for preventing lost recharge is to maintain predevelopment recharge rates. Complications with this policy may arise in areas where there is a shallow water table, clayey soils, or a history of localized ponding. These factors lead to adding drainage systems for new or existing development. Annual average recharge rates were estimated for much of Clark County in 1990 (Snyder and others, 1994). Stormwater drainage systems and land use can be used to infer areas where recharge has been lost due to development.

Lost Recharge Management Priority

Maintaining recharge rates is a moderate to high management priority due to the need to maintain stream flows during the dry season. It is complicated by development in areas where soils do not readily accept the amounts of water generated by concentrating runoff into stormwater infiltration facilities. Low-

impact development practices developed in other parts of the country may be applicable.

High management concern rating criteria include:

N	Immediate action is required to prevent loss of a beneficial use due to the problem;
N	Action is required to protect an exceptional water body such as a Class AA river;
N	Immediate action is required to solve a property loss or public safety problem;
Y	Action will be likely to have an influence during the next five years; or
Y	Action is required to meet the stormwater management program priorities.

Moderate management concern rating criteria include:

N	A beneficial use loss would be lessened by the action;
N	A current beneficial use may be threatened in the next five years;
N	Action may be required within the next five years to solve or address the problem; or
Y	Action may have an influence during the next five years;

Low management concern rating criteria include:

N	A beneficial use is not threatened by the problem;
N	The problem is not necessary to address as a stormwater management program priority; or
N	Action is unlikely to influence the problem within five years.

Excessive Nutrients in Groundwater

Nutrients, principally forms of nitrogen and phosphorus, can enter groundwater via infiltrated stormwater. When the groundwater discharges as springs and creeks, the nutrients enter surface water and may cause excess aquatic plant and algae growth and dissolved oxygen problems in slow moving streams or lakes. Data from public water supply wells, an investigation by Turney (1990), and a large number of nitrate tests by Clark Public Utilities in the early 1990's indicate that nitrate concentrations in the upper aquifers are at 2 mg/l to about 5 mg/l throughout the Vancouver urban area. Some areas have higher concentrations, slightly higher than 5 mg/l. Often, in urban areas having many septic systems, the nutrient concentration of the water table aquifer is greater than typical stormwater. Turney (1990) included phosphorus data that suggested Clark County groundwater had relatively high natural dissolved phosphorus content (median 70 ug/l) compared to desirable concentrations in lakes.

Nitrate has a groundwater and drinking water standard of 10 mg/l. There is no groundwater standard for phosphorus. Sources and solutions are the same as nutrients in surface water.

Excess Nutrients in Groundwater Management Priority

Controlling nutrients in groundwater requires a long-term commitment to reduce the use of fertilizers and sewer areas with high densities of septic systems. Education to reduce fertilizer use should be a priority of a stormwater management program.

High management concern rating criteria include:
N Immediate action is required to prevent loss of a beneficial use due to the problem;
N Action is required to protect an exceptional water body such as a Class AA river;
N Immediate action is required to solve a property loss or public safety problem;
N Action will be likely to have an influence during the next five years; or
N Action is required to meet the stormwater management program priorities.
Moderate management concern rating criteria include:
N A beneficial use loss would be lessened by the action;
N A current beneficial use may be threatened in the next five years;
N Action may be required within the next five years to solve or address the problem; or
Y Action may have an influence during the next five years;
Low management concern rating criteria include:
Y A beneficial use is not threatened by the problem;
Y The problem is not necessary to address as a stormwater management program priority; or
N Action is unlikely to influence the problem within five years.

Pathogenic Organisms in Groundwater

Pathogenic organisms may enter groundwater via infiltrated stormwater. While this has not been found to be a significant problem, no investigations have been performed to examine pathogen discharge from stormwater infiltration facilities in gravel aquifers. The standard for groundwater is essentially no pathogenic organisms.

Pathogenic Organisms in Groundwater Management Priority

No information exists to suggest that this is a problem. It is currently a low management priority. Some research may be needed to evaluate whether shallow private water wells in gravel soils may be at risk. A substantial capital program would be required to address any existing drywells that discharge directly to groundwater.

High management concern rating criteria include:
N Immediate action is required to prevent loss of a beneficial use due to the problem;
N Action is required to protect an exceptional water body such as a Class AA river;
N Immediate action is required to solve a property loss or public safety problem;
N Action will be likely to have an influence during the next five years; or
N Action is required to meet the stormwater management program priorities.
Moderate management concern rating criteria include:
N A beneficial use loss would be lessened by the action;
N A current beneficial use may be threatened in the next five years;
N Action may be required within the next five years to solve or address the problem; or
Y Action may have an influence during the next five years;
Low management concern rating criteria include:
Y A beneficial use is not threatened by the problem;
Y The problem is not necessary to address as a stormwater management program priority; or
N Action is unlikely to influence the problem within five years.

PROBLEM PRIORITIZATION BY BASIN OR PLANNING AREA

Needs are prioritized for each basin or planning area. Planning areas are contiguous sub areas of basins that have similar geography and drainage, or groups of small basins draining to a common water body. The basin area approach is used

because many water resource programs are implemented for individual basins. Currently, there is a utility in Burnt Bridge Creek basin. The Lacamas Lake Restoration Program and East Fork Implementation Program apply only to those specific basins. The results are included in Appendix B.

Examining priorities and problems at a basin level also makes sense if each basin has a slightly different set of management concerns.

The process for establishing priorities is to rank the severity and management concern of the generic problems from the previous section for each basin or planning area.

Within each basin or planning area, problems are assigned a High, Moderate or Low rating to describe the severity of the problem. The ratings are subjective, but are based on available information such as 303(d) listing, 305(b) descriptions, local data, and local knowledge. In many cases the rating is a tentative one, based on limited information.

Each problem is then assigned a management concern rating. The management concern rating reflects the degree to which the problem is of immediate concern for watershed management. The management concern rating reflects several criteria including whether the problem needs to be addressed under stormwater management program priorities.

Another way of looking at the management concern rating is to consider it a measure of the need for immediate action to mitigate or prevent further degradation by the problem. Generally, a high rating implies that the problem needs to be addressed soon to stop loss of, or to rehabilitate the beneficial uses of a water body. A high rating can also be applied to protecting an exceptional resource such as a Class AA stream. Moderate suggests that the problem may not benefit from immediate action but should be considered as a part of the program if funds are available. A low suggests that immediate action is not required or that there may be no feasible solution.

High management concern rating criteria include:

- Immediate action is required to prevent loss or degradation of a beneficial use due to the problem;
- Immediate action is required to solve address public safety and property loss;
- Action is required to protect an exceptional water body such as a Class AA river;
- Action will be likely to have an influence during the next five years; or
- Action is required to meet the stormwater management program priorities.

Moderate management concern rating criteria include:

- A beneficial use loss may be lessened by the action;
- A current beneficial use may be threatened in the next five years;
- Action may be required within the next five years to solve or address the problem;
- Action may have an influence during the next five years; or

Low management concern rating criteria include:

- A beneficial use is not threatened by the problem;
- The problem is not necessary to address as a stormwater management program priority; or
- Action is unlikely to influence the problem within five years.

PROGRAM ELEMENT NEEDS AND PRIORITIES

INTRODUCTION

Problems, such as excess sediment, and the sources and solutions for those problems were identified in the previous section. This section takes a look at the various County Program Elements described in Chapter 3 and describes the stormwater management needs of those programs. Program Elements are general areas of activity such as a capital improvement program and operations and maintenance of storm sewers and roads.

REVENUE SOURCE NEED

Along with the program element needs, there is an over riding need to establish a revenue source dedicated to stormwater management. The process to establish a revenue source should include establishing an advisory committee to advise the County on the best method to fund the stormwater management program. The establishment of an advisory group and stormwater management program funding is discussed in the Public Involvement for Watershed Management and Education section of Chapter 3.

REGULATORY PROGRAM NEEDS

Regulatory programs implement code requirements. The current program centers on regulations to limit flooding, water quality degradation, and habitat degradation or loss associated with development actions. The NPDES permit will require the County to control pollutants from existing development and increase stormwater control requirements for new development and redevelopment.

Unmet Regulatory Program Needs

Several important unmet needs are identified by the Clark County Department of Community Development and Public Works Department staff, through public comments, in the requirements of the Clean Water Act, and by proposed state permit conditions.

State and Federal Requirements

Ecology expects the County to have regulations for new development and redevelopment that are substantially equivalent to the Stormwater Management Manual for the Puget Sound Basin (Washington Department of Ecology, 1992). In

addition to this basic equivalency to the existing manual, Ecology has indicated that conformance to peak flow control requirements in the Puget Sound Manual may not be sufficient. The County may need to move toward the type of regulatory program being adopted in King County, which includes flow duration controls in addition to peak flow control.

Requirements of the Clean Water Act include legal authority to control pollutant discharges from existing activities to storm sewers. The legal authority should be in place when the stormwater management program is adopted. There is a need for an outreach and enforcement program to implement the pollution source controls for existing development.

Another Clean Water Act requirement is that the County adopt ordinances that require maintenance of private storm sewer systems.

Regulatory Program Unmet needs

Several minimum requirements of the Puget Sound Manual are not included in the County regulatory program and will need to be added during the permit term.

Along with the minimum requirements of the Puget Sound Manual, there are additional unmet program needs that are not necessarily required for equivalence to the Puget Sound Manual. A major problem is residential stormwater infiltration facilities that do not perform as intended due to soil clogging, shallow groundwater, or groundwater mounding near infiltration facilities. Almost all of the residential subdivision stormwater control facilities are transferred to County ownership after a 'maintenance period'. Until recently, almost no effort was made to evaluate these facilities prior to acceptance. There is a need for a formalized system and standards for evaluating and testing residential stormwater facilities performance prior to ownership transfer to the County. Another facilities acceptance need is the ability to recover costs for repairing facilities that fail to perform as designed. Better methods of assuring that the facilities are not plugged with eroded soil during development are also required.

The erosion control program is unable to prevent many projects from discharging sediment to streams, wetlands, stormwater facilities, and adjacent properties. The key issues appear to be a focus on sediment control BMPs that fail to prevent erosion from occurring and noncompliance with the current code. Financial guarantees are also lacking.

Sensitive area regulations for wetland and habitat include monitoring requirements for mitigations. There may not be a sufficient number of specialized staff to perform the application review and monitoring of habitat plans and wetland mitigations.

List of Unmet Regulatory Program Needs

The following list includes the main unmet needs for the regulatory program. The first unmet need is required to be in place at the time of the Part 2 application.

- Legal authority to control pollutant discharges to County storm sewers.
- A program to inspect and enforce pollution controls for existing land use.
- An ordinance requiring maintenance of private storm sewer facilities.
- A program to inspect and enforce maintenance of private storm sewer facilities.
- Additional regulations to bring the County Stormwater Control Ordinance into equivalence with State standards for the Puget Sound Basin.
- Review and make improvements in the process to assure stormwater facilities will perform as intended after they have been built.
- Evaluation and plan to prevent failing infiltration facilities.
- An overhaul of the Erosion Control Program to make it effective at preventing erosion.

Additional Unmet Needs from Problem analysis in this Chapter

The unmet regulatory program needs are listed in two sets. These were not high priorities of the County regulatory program. The first set includes unmet needs that address permit requirements. The second set addresses unmet needs that the permit will not require.

Meets a permit requirement

- Investigate low impact development regulations (8.a.)

Does not meet a permit requirement

- Regulatory controls on agricultural and livestock activities
- Downstream evaluation of new development for increased flooding
- Map and regulate periodically flooded areas

OPERATION AND MAINTENANCE NEEDS

An operation and maintenance program is required to assure that stormwater control facilities and conveyances function properly to control flooding and to treat stormwater for pollutants. Operations also removes sediment, trash, and debris from storm sewers, roads and ditches. A successful program also provides the benefits of protecting public safety, avoiding private damage claims, increasing the service life of facilities, limiting repair frequency, and improving aesthetics. Each year, the public routes hundreds of complaints and service requests to the Operations Division. Maintenance activities are widely observed by the public and are probably the most well known and appreciated Public Works function.

The NPDES permit requires the County to establish policies for the program and a schedule for improving the program to meet them. It also requires the County to establish a program to ensure that private storm sewers are properly maintained.

The O and M section of Chapter 3 has a tabulation of the storm sewer system facilities within unincorporated Clark County and the maintenance performed on them, as well as the road maintenance activities.

Burnt Bridge Creek Utility is anticipated to continue O and M at its current level, supported by a small utility fee equal to the fee charged by the City of Vancouver utility in that basin.

Unmet O and M Needs

Funding

Generally, funding for O and M has not kept pace with new development and changing standards for storm sewer maintenance. One funding issue is that when the 1994 Stormwater Control Ordinance was passed, no funding mechanism was established to maintain the many facilities that would be dedicated to the County. Budget constraints limit many activities such as catch basin and drywell cleaning to being performed less often than called for by County standards to maintain function and limit pollutant discharges. A funding source is required to increase maintenance to minimum standards proposed by the program.

Shift to Scheduled Maintenance

The primary unmet need is to shift from the current practice of largely performing maintenance on a complaint-driven basis to a program that routinely inspects and then maintains as needed. A table in the O and M section of Chapter 3 summarizes all of the proposed changes to the program.

Standards, Inventory and Tracking

There is an unmet need to establish standards for O and M activities and a system to assure that they are met. Standards and a tracking system provide an accurate description of the degree to which standards are being met and the information to take steps to either revise standards or increase O and M if standards can not be met.

A major unmet need is a computerized GIS-based inventory of all County facilities, ditches and pipes, and culverts for tracking maintenance activities. Such a system would allow O and M costs to be accurately estimated.

In addition, the County needs to establish a comprehensive system to assure that privately owned storm sewers are properly maintained.

MONITORING NEEDS

Monitoring is used here to include environmental monitoring such as water quality testing and stream flow gauging. It also includes actions that monitor program success, such as tracking regulatory program effectiveness and mapping or inventory of features that are needed to develop or evaluate the stormwater management program. Monitoring is prioritized to meet both County needs and the requirements of the permit.

State Requirements

The permit requirements for the Puget Sound Basin are also applied to Clark County. They are to address at least one of the following:

a) Estimate concentrations and loads from representative areas or basins to be used in evaluating overall program effectiveness;
b) Evaluate the effectiveness of selected Best Management Practices;
c) Identify specific sources of pollution; and
d) Identify the degree to which stormwater discharges are impacting selected receiving waters and sediments. The monitoring program shall include a quality assurance/control plan.

Unmet Monitoring Needs

The current monitoring program has been geared toward collecting long-term stream flow and rainfall data and monitoring for a specific problem or project. The needs for stormwater management are broader and address characterization of the resources, identifying and removing specific pollutant sources, and tracking program activities. Monitoring to create better hydrologic models is critical to cost effective capital improvement projects.

Conversations with Ecology and internal discussions have identified three main areas of environmental monitoring that are a high priority for the first permit term.

1) Gathering and compiling data to create continuous hydrologic models for Clark County river basins is required to develop adequate controls for stormwater runoff. Current standards in the Puget Sound Manual and County code will not suffice. Much of the data to create models is currently available but an evaluation will be required to determine if it is sufficient for the needs of the models.

2) Monitoring to identify and remove pollutant sources is a priority for NPDES because the intent of the permit is to reduce pollutant loads.

3) Defining the health of streams and wetlands is an important activity to provide information to prioritize stormwater management actions in each area. Types of data gathering include surveys to categorize riparian habitat, studies of benthic invertebrate communities, and fish surveys.

PUBLIC INVOLVEMENT AND EDUCATION PROGRAM NEEDS

Core components of the program are intended to: establish a watershed management process for protecting and rehabilitating beneficial uses; reduce impacts on riparian habitat by livestock; promote the reduction and proper disposal of moderate risk wastes generated by households and businesses; and improve the effectiveness of compliance with water resource regulations.

Public Involvement for Watershed Management Needs

Many of the problems within a watershed are impossible to address by individual agencies or small groups. The watershed management approach uses a flexible framework for managing land, biological, water, infrastructure, human, and economic resources within a watershed. Watershed management is occurring in the Lacamas Lake basin and is likely to play a larger role in basin management due to state and federal programs to protect anadromous fish populations and implement Total Maximum Daily Loads for nonpoint pollution.

It is anticipated that listing of trout and salmon species under the Endangered Species Act will lead to comprehensive watershed management. The prospect of the state developing non-point Total Maximum Daily Loads under provision of Section 303(d) of the Federal Clean Water Act for several Clark County streams is another action that could raise the need for watershed management.

Watershed management under initiatives to protect sea run salmon and trout will be regional in nature and likely address activities beyond the scope of the NPDES permit.

Unmet Watershed Management Needs

The main unmet need is a county-wide process to establish the revenue source, priorities, and interagency coordination for stormwater and watershed management.

The NPDES permit has a requirement to coordinate with other permittees. This could be a watershed management activity. Additional guidance from Ecology includes an expectation that permittees will conduct watershed or basin analysis to assess and evaluate the effects of future development.

Unmet Public Involvement and Education Program Needs

Public involvement and education elements are parts of programs that address specific needs such as agriculture and small quantity waste generators. There is a need to create an overall program that addresses stormwater management and specific permit requirements by defining roles within the existing County programs and defining the roles of other agencies.

The most important unmet need to satisfy the permit requirements is an outreach program directed at implementing source control BMPs for existing development. These activities are needed to support Clean Water Act requirements to control pollutant discharges from existing activities.

Another specific unmet need is a county-wide program to encourage restoration or rehabilitation of riparian areas. The County is currently working to amend the habitat ordinance to include agricultural activities.

More generally, a broad education program is needed to provide ongoing and consistent education for both children and adults. Program areas could include

revival and expansion of the River Rangers program for school children and starting programs such as the Governor's Master Watershed Steward program for adults.

CAPITAL IMPROVEMENT NEEDS

Stormwater capital improvement needs are identified in preliminary designs for Burnt Bridge Creek basin and the unadopted preliminary CIP for the Lakeshore/Salmon Creek area. Other capital needs are being defined by a project to identify solutions for about 400 drainage problems.

Unmet Capital Improvement Needs

Funding

Implementing a capital improvement program takes large amounts of cash. There is no source of funding sufficient to establish and perform the CIP described in the unadopted Salmon Creek/Lakeshore plan, the Burnt Bridge Creek Utility plan, or the improvements likely to be identified by the "400 drainage problems project". Road Fund revenue is sufficient for a limited CIP, but this takes money away from needed road projects and maintenance.

Planning

Planning to optimize the existing storm sewer system requires a program to inventory, describe and evaluate existing facilities for possible retrofit to improve performance.

A program is needed to identify sites where water quality treatment facilities, flow control facilities, and channel habitat rehabilitation projects are most needed.

The Washington Department of Transportation has funds earmarked for building retrofit facilities along state highways. There is a need to identify and promote projects for WDOT construction along Interstate 5, Interstate 205 or other state-operated highways.

Construction

Drainage control facilities to address the most severe localized flooding problems are needed. In August 1998, the County earmarked about $1,900,000 to address the highest priority flooding problems in the Lakeshore/Salmon Creek area.

ACTIONS TO BE TAKEN DURING PERMIT TERM

Chapter 3 describes current and proposed actions that will address these problems. The NPDES permit does not require the County to address localized flooding problems. It is being addressed by a capital improvement program initiated in 1998. Chapter 4 describes the actions by permit requirement.

CHAPTER 3

STORMWATER MANAGEMENT PROGRAM ELEMENTS

CONTENTS

Capital Improvement Program

- Program Overview
- Stormwater Projects
- Process to Prioritize Projects
- Preliminary Capital Plans for Developing Basins
- Non-Stormwater Projects that Enhances Beneficial Uses

INTRODUCTION

BACKGROUND

Clark County has been implementing stormwater management and resource protection programs for several years. In 1995, the County began a watershed planning program intended to establish a systematic drainage management program in urban and rural areas. Stormwater control regulations, sensitive lands regulations, and waste reduction programs were implemented in the 1990's.

This Chapter groups stormwater management programs into five main program elements. The program elements are described here:

- Regulation;
- Operation and Maintenance;
- Monitoring and Evaluation;
- Public Involvement for Watershed Management Outreach and Education; and
- Capital Improvement Program.

Activities programs and projects within the five program elements are performed by the Public Works Department and Department of Community Development. Community Development handles the review, inspection, and enforcement of activities that require development permits. Sensitive lands regulation and GMA planning are also handled by Community Development.

Public Works Department handles design and construction of stormwater capital projects, operation and maintenance of roads, storm sewers and stormwater facilities, stream flow and rainfall monitoring, and waste reduction programs. The Environmental Services Division of the Public Works Department performs stormwater capital planning, NPDES permit administration, stormwater monitoring, and public outreach programs for hazardous material management and livestock management. The Burnt Bridge Creek Utility is operated by the Public Works Department in the areas of Burnt Bridge Creek basin outside the Creek.

PURPOSE AND SCOPE

This chapter describes the stormwater management program and proposed County activities for the first five-year NPDES permit term (probably 1999-2003)

Descriptions for each program element will:

- Describe the current program and proposed actions for the permit term; and
- Present the staffing and budget needed to perform each program.

Program elements are described using information provided by the County division or department that performs the activity.

DEGREE OF IMPLEMENTATION

Proposed actions lack a dedicated revenue source in almost every case. It is the intent of the County to establish a dedicated revenue source; however, the implementation of proposed actions is contingent on the level of new funding. It is possible that a number of the proposed actions in this chapter will not be implemented as scheduled. Other factors influence the level of funding. Annexations reduce tax base. Overall County priorities may require allocation of funds to non-stormwater activities.

Also, the SWMP includes priority activities that do not meet a permit requirement. These are included to provide a clear picture of the overall program. The activities that do not meet permit requirement may be dropped from the program or not performed by a choice of the County.

REGULATORY

PROGRAM OVERVIEW

Regulatory programs serve several functions. Regulations for new development and redevelopment provide standards to ensure that new construction minimizes water pollution by sediment during construction and that the completed project has runoff controls for pollutants and discharge rates. Regulations also have provisions aimed at protecting existing sensitive areas such as wildlife habitat and water bodies. Regulatory program activities are performed by the Department of Community Development.

For stormwater and erosion controls, the NPDES permit will require Clark County to meet the minimum requirements of the Stormwater Management Manual for the Puget Sound Basin (Washington Department of Ecology, February 1992) and additional standards to protect fish habitat. Many of the proposed NPDES requirements are included in current regulatory activities but some major code changes will be required. Along with the regulations for development, the permit mandates adoption of code requiring private storm sewers to be maintained and to control pollutant discharges to County owned or operated storm sewers.

SUMMARY OF FTE ANI
REGULAT

CURRENT

NAME	CURRENT (1998) FTE	CURRENT (1998) COST	YEAR 1 FTE	YEAR 1 COS
Stormwater Control Code Enforcement Administration	0.06	$4,500	0.06	$4,50
Stormwater Requirements for Geologic Hazard Areas	0.1	$8,200	0.1	$8,20
Development Plan Review for Stormwater Controls Under Chapter 13.25	4	$324,000	4	$324,0
Development Inspection for Stormwater Controls	1.2	$90,716	1.2	$90,7
Inpsection of Building Storm Sewer Requirements	0.88	$66,525	0.88	$66,5
Stormwater Facilities Acceptance Proccess	0.1	$8,200	0.1	$8,20
Erosion Control Plan Review for Development Projects	0.4	$32,800	0.4	$32,8
Erosion Control Inspection and Field Enforcement for Development Projects	0.8	$60,730	0.8	$60,7
Erosion Control Inpection for Building Sites	1.1	$83,500	1.1	$83,5
Erosion Control Enforcement Administration	0.3	$22,730	0.3	$22,7
Critical Aquifer Recharge Requirements	0.05	$4,000	0.05	$4,00
Wetland Protectiom Plan Review	0.5	$41,000	0.5	$41,0
Inspect, Monitor, and Enforce Wetland Requirements	0.5	$41,000	0.5	$41,0
Habitat Protection Plan Review and Monitoring	0.4	$40,000	0.4	$40,0
Habitat Protection Ordinance Enhancement	0.2	$20,000	0.2	$20,0
TOTAL:	**10.59**	**$847,901**	**10.59**	**$847,9**

PROPOSED

NAME	CURRENT (1998) FTE	CURRENT (1998) COST	YEAR 1 FTE	YEAR 1 COS
Digital Flooded Area Photos	0	$0	0	$15,0
Develop Regulatory Program Based on Continuous Model	0	$0	0	$0
Establish Policies for Redevelopment Projects	0	$0	0	$0
Implement Upgraded Flood Plain Program	0	$0	0.75	$61,5
Investigate Low-Impact Development Standards	0	$0	0	$0
Storm Sewer Maintenance Ordinance	0	$0	0.1	$8,20
Add an Inspector to Enhance ErosionContorl for Building Projects	0	$0	1	$75,0
Flood Plain Program Upgrade	0	$0	0.25	$20,5
Overhaul Erosion Control Program	0	$0	1	$82,0
Establish Program to Implement Water Quality Ordinance	0	$0	1	$82,0
Staff to Support and Implement Continuous Model	0	$0	1	$82,0
Develop Continous Hydrologic Model for Regulatory and Design Use	0	$0	0	$200,0
Implement Facilities Acceptance Program	0	$0	0.5	$41,0
Establish a Better Stormwater Facilities Acceptance Program	0	$0	0.5	$41,0
Add Two Code Enforcement Officers for Stormwater and Erosion Control	0	$0	2	$150,0
Add Stormwater Facilitiy Inspector	0	$0	1	$75,0
Stormwater Equivalence to the State Manual	0	$0	1	$82,0
Add One Inspector to Improve Erosion Control Compliance for DevelopmentProj	0	$0	1	$75,0
TOTAL:	**0**	**$0**	**11.1**	**$1,090,**
PROGRAM TOTAL:	**10.59**	**$847,901**	**21.69**	**$1,938,**

SUMMARY OF REVENUE SOURCES BY YEAR
REGULATORY

CURRENT

SOURCE	*CURRENT* (1998) REVENUE	*YEAR 1* REVENUE	*YEAR 2* REVENUE	*YEAR 3* REVENUE	*YEAR 4* REVENUE
BUILDING FEES	$150,025	$150,025	$150,025	$150,025	$150,025
DEVELOPMENT SERVICES FEES	$610,649	$610,649	$610,649	$610,649	$610,649
GENERAL FUND	$87,230	$87,230	$67,230	$67,230	$67,230
TOTAL:	**$847,904**	**$847,904**	**$827,904**	**$827,904**	**$827,904**

PROPOSED

SOURCE	*CURRENT* (1998) REVENUE	*YEAR 1* REVENUE	*YEAR 2* REVENUE	*YEAR 3* REVENUE	*YEAR 4* REVENUE
UNKNOWN	$0	$1,090,200	$756,000	$580,600	$546,000
TOTAL:	**$0**	**$1,090,200**	**$756,000**	**$580,600**	**$546,000**
PROGRAM TOTAL:	**$847,904**	**$1,938,104**	**$1,583,904**	**$1,408,504**	**$1,373,904**

CURRENT REGULATIONS

Clark County currently uses a series of development regulations to limit water resource degradation due to stormwater runoff, sediment erosion, and development in or near sensitive areas.

- Stormwater Control, Chapter 13.25
- Interim Erosion Control, Chapter 13.27
- Grading Rules under the Uniform Building Code
- Wetlands Preservation, Chapter 13.36
- Wildlife Habitat Preservation, Chapter 13.51
- Geologic Hazard Areas, Chapter 13.60
- Critical Aquifer Recharge Areas 13.70
- proposed Water Quality Ordinance, Chapter 13.12
- Shoreline Management, Chapter 18.330
- Flood Plain Controls, Chapter 18.327
- Fire Marshal's Office under the Uniform Fire Code

Chapter 13.25, 13.27, 13.36, and grading requirements are described in the NPDES Part 1 application and attached to the Part 1 application. These code chapters provide substantial compliance with the Permit Condition S7.B.8.a, stormwater control requirements. The following section is a brief description of the code chapters.

Stormwater and Erosion Control for New Development and Redevelopment (Chapter 13.25 and Chapter 13.27 Clark County Code)

Stormwater Control

Clark County has adopted, by reference, most of the BMPs in the Stormwater Manual Puget Sound Basin (Washington Department of Ecology, February 1992) as the standard for design and construction of stormwater control and treatment facilities and source control BMPs.

Subject projects are those that require a County development permit and would cause the creation or potential creation of more than 2,000 square feet of impervious area within the urban growth boundary or 5,000 square feet outside the urban growth boundary, and replacement of existing structures greater than 5,000 square feet on industrial or commercial parcels. Addition of more than 1,000 square feet of non-building impervious area requires installation of an oil/water separator for many commercial and industrial land uses. County projects such as road improvements are subject to the code.

The Department of Community Development, Development Services evaluates projects for compliance with Chapter 13.25 as a condition of application approval. The Stormwater Control Ordinance is enforced using remedies and procedures under Title 32 of the Clark County Code.

Implementation of the Stormwater Control Ordinance is monitored by inspection of facilities by the Department of Community Development during construction. Most of the residential stormwater facilities are dedicated to the County after a two year maintenance period. Acceptance of the facilities by the county is conditioned on an inspection to verify that the storm sewer system and control facilities are constructed as approved and are functioning as designed. A limited program is being initiated to field verify stormwater control facility performance.

Erosion Control

The Erosion Control code (Chapter 13.27 CCC) was drafted as an interim measure prior to development of a more comprehensive code. Chapter 13.27 applies to land disturbing activities greater than 2,000 square feet. Forest practices and agriculture which are regulated under Title 222 WAC are exempt.

The County ordinance adopts, by reference, Chapter II-5 of the Stormwater Management Manual for the Puget Sound Basin (Washington Department of Ecology, February 1992) and Section 3 of the Erosion Control Plans Technical Guidance Handbook developed by the City of Portland, Oregon and Washington County, Oregon (November 1989).

Erosion Control Plans are reviewed for compliance with standards by Development Services Division engineers as a condition of approval.

Enforcement is executed by the Department of Community Development under the authority of Title 32 CCC to issue citations and stop work orders.

Comparison of Local Code to Puget Sound Minimum Requirements

The Clark County stormwater control code, erosion control code and sensitive lands code chapter were compared to these minimum standards in a separate report (Clark County Public Works, February 1998). Main points from the report are summarized here. A complete version of the report is included as Appendix C.

The standard for stormwater and erosion control regulations for new development and redevelopment is Ecology's Stormwater Management Manual for the Puget Sound Basin (Puget Sound Manual). Ecology has stated that Clark County does not need to adopt the Puget Manual but have "substantially equivalent" standards (O'Brien, Feb. 1996). Substantially equivalent is defined by Ecology (March 1994) as providing an equal or greater level of treatment or protection.

The Puget Sound Manual is the primary technical manual for the County stormwater control and erosion control regulations. However, the manual is used chiefly as technical guidance for the design of BMPs. Clark County minimum requirements are generally stated in the local code.

Stormwater issues that influence specific sensitive areas such as wetlands and geologically hazardous areas are generally handled in code sections for each sensitive area.

Major Differences Between County Code and the Puget Sound Manual Minimum Requirements

Puget Sound Manual Erosion Control requirements apply to land disturbing activities of less than one acre. Small parcel requirements include constructed access route, stabilization of denuded areas, protection of adjacent areas, and BMP maintenance.

Clark County applies requirements only to land disturbing activities greater than 2,000 square feet.

The Puget Sound Manual requires Stabilization of Denuded Areas within a specified amount of time. Clark County specifies within a timely manner.

The Puget Sound Manual requires application of Minimum Standards to Redevelopment. This requirement includes the application of source controls to the entire site which is being redeveloped, including adjacent parcels. The requirement also includes applying all minimum requirements for the sites where redevelopment occurs if one or more of the following applies:

- Existing site is greater than 1 acre with 50 percent or more impervious;
- Site discharges to a water body that has a documented water quality problem such as a 305(b) listing; or
- Site is identified in a basin plan or GMA planning as needing additional controls.

Clark County does not have these requirements.

Erosion and Sediment Control: There are fourteen specific requirements for erosion and sediment control. All must be followed. The following Erosion and Sediment Control Requirements list areas where County Code is at least partly non-equivalent. Many are addressed by the policy of adding them to plan sheets as a condition of approval.

- Erosion and Sediment Control Requirement #1: Stabilization and Sediment Trapping
- Erosion and Sediment Control Requirement #2: Delineate Clearing and Easement Limits
- Erosion and Sediment Control Requirement #4: Timing and Stabilization of Sediment Trapping Measures
- Erosion and Sediment Control Requirement #5: Cut and Fill Slopes
- Erosion and Sediment Control Requirement #6: Controlling Off-site Erosion
- Erosion and Sediment Control Requirement #7: Stabilization of Temporary Conveyance Channels and Outlets
- Erosion and Sediment Control Requirement #11: Removal of Temporary BMPs
- Erosion and Sediment Control Requirement #12: Dewatering Construction Sites
- Erosion and Sediment Control Requirement #13: Control of Pollutants Other Than Sediment on Construction Sites

- Erosion and Sediment Control Requirement #15: Financial Liability

The Puget Sound Manual requires runoff treatment BMPS that are sized to capture and treat the water quality design storm, defined as the 6-month, 24-hour return period storm.

Clark County uses a design storm one-half the size of the Puget Sound Manual.

The Puget Sound Manual has special wetland requirements. Mainly, no facilities are allowed in wetland buffers and no treatment BMPs are allowed in mitigation wetlands.

Clark County does not have these requirements.

The Puget Sound Manual requires an off-site analysis and mitigation. **A**ll development projects shall conduct an analysis of off-site water quality impacts resulting from the project and shall mitigate these impacts. The analysis shall extend a minimum of one-fourth of a mile downstream from the project. The existing or potential impacts to be evaluated and mitigated shall include, at a minimum, but not be limited to:

(i) excessive sedimentation
(ii) streambank erosion
(iii) discharges to ground water contributing or recharge zones
(iv) violations of water quality standards
(v) spills and discharges of priority pollutants

Clark County does not have this requirement.

The Puget Sound Manual Exceptions to Minimum Requirements. The Puget Sound Manual grants exceptions to Minimum Requirements based on a set of criteria.

Clark County does not use the same criteria.

Grading Regulation

Grading is regulated under the Uniform Building Code and the County sensitive areas code. Grading plans are reviewed by the Department of Community Development. Enforcement is by the Department of Community Development under Title 32 of the Clark County Code.

Wetlands Protection (Chapter 13.36 Clark County Code)

The Wetlands Ordinance has the goals of: 1) no net loss of wetland area and functions; 2) encourage restoration and enhancement of degraded and low quality wetlands; 3) provide greater protection for higher quality wetlands; and 4) maintain consistency with federal protection measures. Regulated activities include triggering permits such as subdivisions and site plans and grading permits. Other regulated activities include: moving 50 yards of fill, disturbing over an acre of wetland and buffer, residential construction in high quality wetlands, construction of stormwater facilities, and certain types of land clearing.

For wetland permits that require buffer or wetland mitigation, there is a monitoring plan with a minimum duration of five years. The County requires a financial security to ensure compliance with the monitoring plan. The applicant is required to file monitoring reports. The County is responsible for verifying the monitoring reports. There is one staff person who reviews and inspects all wetland permit activities.

Habitat Conservation (Chapter 13.51 Clark County Code)

The Habitat Conservation Ordinance, effective August 1997 is intended to protect sensitive areas that are needed to perpetually support fish and wildlife. Regulated areas include riparian areas for DNR Class 1, 2, 3, 4, and 5 waters and other special habit areas. Almost all development activities in the habitat areas are subject to the code, including minor additions (25 percent increase in footprint) and vegetation clearing. State regulated forest practices are exempt, as are activities in currently cultivated areas.

Project proposals within habitat protection areas are required to substantially maintain the level of habitat function and minimize disruption by the proposal. Projects shall employ mitigation measures including avoidance buffers, enhancement, monitoring and covenants. There is one county staff person who reviews and inspects all habitat conservation covenant requirements.

Geologic Hazard Areas, (Chapter 13.60 Clark County Code)

The code establishes erosion hazard areas using published federal and Washington DNR soil mapping of severe erosion hazard. The adopting ordinance for Chapter 13.60 amended the Erosion Control Regulations, Chapter 13.27 to allow the County to require additional erosion controls in erosion hazard areas. Chapter 13.60 requires avoidance of development in slope hazard areas and includes provisions for piping runoff away from slope hazards.

Critical Aquifer Recharge Areas, (Chapter 13.70 Clark County Code)

This code defines sedimentary rocks aquifers and wellhead protection areas as critical aquifers and regulates a list of commercial and industrial development activities. Controls are largely to demonstrate that the development will apply appropriate best management practices to prevent groundwater degradation.

Water Quality Ordinance (Draft Chapter 13.26, anticipated adoption Nov. 1998)

Under the Clean Water Act and Washington State requirements for obtaining a NPDES permit, Clark County is required to obtain legal authority to prevent non-stormwater discharges to its storm sewers.

The current draft ordinance is largely from King County code and describes the phased use of source control BMPs to eliminate illicit, non-stormwater discharges to publicly owned storm sewers and all waters of the state, which are surface water and groundwater.

Shoreline Management Master Program (Chapter 18.330 Clark County Code)

This code permits regulation of development activities in shoreline management areas under relevant state regulations.

Flood Plain Regulations (Chapter 18.327 Clark County Code)

Development in flood plains is regulated to limit property loss and protect public safety.

Fire Marshall's Office Under the Uniform Fire Code

The Clark County Fire Marshall inspects occupancies on a regular basis. Those occupancies where there are hazardous materials present in any significant quantity get an inspection annually or more frequently if required. Inspections examine the hazardous material use, handling and disposal methods and note any improper disposal, uncleaned spills, bad processes that needs correction. Failure to comply with a Fire Marshall's notice is a misdemeanor for which citations are issued and legal recourse is pursued.

PROPOSED NEW REGULATORIONS TO MEET NPDES REQUIREMENTS

New regulations are necessary to meet requirements of the permit. A large work effort will be required to put these in place. The section describing the Stormwater Management Advisory Committee under Public Involvement and Education includes public outreach for code additions. Code additions are anticipated to be completed during the first year and a half of the permit term.

The following section describes briefly the proposed actions to bring code into equivalence with the Puget Sound Manual for stormwater and erosion controls, meet permit requirements for maintence of private storm sewer systems, and new Ecology requirements for peak flow and flow duration.

Stormwater Equivalence to the Puget Sound Manual

Approximately one FTE is devoted to this task during year one of the permit term. Areas of non-equivalence will be clearly defined and changes to the current code to be substantial equivalence.

Erosion Control Equivalence to the Puget Sound Manual and Other Program Changes

Approximately one FTE is devoted to the task of overhauling how the County handles erosion control. This is a complex issue that requires some code revisions, researching other erosion control programs, setting up a work plan for an education program, setting up a financial guarantee program, setting up a monitoring program, and establishing consistent enforcement.

Storm Sewer Maintenance Ordinance

This action will draft and adopt an ordinance that requires all existing private storm sewers be maintained to assure proper function and removal of trapped sediment and other pollutants. An existing Puget Sound Basin ordinance will probably be the basis for the code. It is scheduled for completion in the first year of the permit term. Implementation will be through an inspection program established under the O and M program. The inspection program should link with implementation of the Water Quality Ordinance.

Establish Policies for Redevelopment

The minimum requirements of the Puget Sound Manual for adding stormwater controls during redevelopment are difficult to meet. There are several approaches that can be taken to meet this requirement this task, scheduled for the second and third year of the permit term, will attempt to establish policies that the County can follow to implement this requirement.

Develop Regulations to Implement New Peak Flow and Flow Duration Requirements

This action will develop a regulatory program to implement the peak flow and duration requirements that go beyond current State standards. This task may be is anticipated during the second year of the permit.

Development of a Model to Implement New Peak Flow and Flow Duration Requirements

The County will develop a model during the first 18 months of the permit term or interim measure method acceptable to Ecology. The County will require an added staff person to manage development of the model and maintain and improve the model.

Investigate Low Impact Development Regulations

Low impact development regulations are intended to promote alternative styles of development that reduce stormwater impacts. The primary means is building the

site so that impervious area is limited and stormwater is trapped and infiltrated on site using numerous smaller vegetated basins. This project would examine the possibility of adopting low impact development options.

REGULATORY PROGRAM PROJECTS NOT REQUIRED FOR NPDES

Flood Plain Regulatory Program

Development Service identified a need for improved regulatory controls on flood plain development to meet current federal standards.

Description of this activity is included as information about Clark County stormwater or resource protection programs. It is not a required part of the NPDES Stormwater Management Program.

Digital Flood Photos

A set of aerial photos was taken during extensive flooding during February 1996. Conversion of these photos to a digital map base will facilitate site review for localized flooding.
Description of this activity is included as information about Clark County stormwater or resource protection programs. It is not a required part of the NPDES Stormwater Management Program.

CURRENT ENFORCEMENT

Code Enforcement responds to complaints and concerns from citizens and other agencies regarding grading activities or clearing of vegetation in a wetland or shoreline area. It is our responsibility to coordinate with the respective department to find out if any projects have been approved or any permits have been issued for the activity. If there is a permit we will request that the Inspector assigned to the project verify that it is being constructed according to approved plans. If not, we may place a Stop Work Order or Correction Notice on the job, giving specific directions to apply for permits or remedy the violation within a time frame that seems appropriate for the situation. If the problem isn't remedied in the allotted time, a citation may be issued. A citation may also be issued on the first response if the violation is blatant or a second or third offense. A new citation can be written for each day of violation. If the citation is appealed, Code Enforcement schedules and represents the County in the Appeal Hearing. If fines are not paid liens are placed on the property.

PROPOSED INSPECTION AND ENFORCEMENT

Code Enforcement

Initially, two code enforcement officers will be added to address possible increased enforcement of current and proposed codes. The need for these code enforcement officers will be reviewed and possible changes will occur in the second year of the permit term.

Additional Erosion Control Inspection

One inspector will be added to improve erosion control compliance for development projects. Another building inspector will be added to improve erosion controls on building projects. A new approach to erosion control on building projects is being initiated in late 1998.

Stormwater Facilities Inspection for New Development

One development inspector will be added to improve stormwater facilities inspection.

Stormwater Facilities Acceptance Program

Development Services and Public Works identified a strong need for an improved facilities acceptance process that includes inspection, adequate financial guarantees, assigned responsibility and accountability, and testing methods. A staff person will be added to implement the facilities acceptance program. May also provide additional inspection for construction and maintenance periods.

Description of this activity is included as information about Clark County stormwater or resource protection programs. It is not a required part of the NPDES Stormwater Management Program.

Implementation of the Water Quality Ordinace

New program to reduce pollutant discharges to County storm sewers and waters of the State under Chapter 13.26 CCC. Includes developing a tracking system, an inventory of private systems, and schedule for periodic inspection. Implementation should link with the proposed private storm sewer maintenance program.

NOTICE OF INTENT FORMS FOR CONSTRUCTION ACTIVITIES

The Department of Community Development makes Notice of Intent forms available to proponents of new development or redevelopment. The Development Services Division requires that projects have all governmental permits, including the NPDES general construction permit, as a condition of approval for a Technical Information Report for a Final Stormwater Plan under Chapter 13.25. Subsection 410(12) of the Clark County Code.

OPERATION AND MAINTENANCE

PROGRAM OVERVIEW

The Clark County Public Works Department maintains all County owned or operated stormwater facilities, roads and easements. County facilities include conveyances on county owned road right-of-way or easements, stormwater control or treatment facilities constructed in residential subdivisions then donated to the county, and several regional facilities. Burnt Bridge Creek Utility operation and maintenance is performed by the Public Works Operations Division. No arrangements exist for the County to operate or maintain privately owned facilities. Privately owned multifamily and commercial facilities built under the Stormwater Control Code Chapter 13.25, adopted in 1994 are required to have an operation and maintenance plan that is followed by the owner. The facilities are subject to inspection by the County.

Staff and Budget

Staffing and budget are contingent on the adoption of a revenue source sufficient to fund operations and maintenance at higher standards.

Equipment

The following is a list of major equipment dedicated to road and drainage O and M:

3 Street sweepers
1 Vacuum truck
4 Roadside mowers
1 Roadside brush cutter/mower
6 Backhoes, one is a track vehicle, one is a Drott
4-6 five-yard and 10-yard dump trucks
Numerous pickup trucks

SUMMARY OF FTE AND COST BY YEAR

OPERATIONS AND M

CURRENT

	CURRENT (1998)		YEAR 1	
NAME	FTE		FTE	
		COST		COST
Drywell Cleaning	0	$8,161	0	$8,16
Biofiltration Swale Mowing	0	$19,300	0	$19,3(
Roadside Mowing	4.5	$305,487	4.5	$305,4
County Retention/Detention Facility Maintenance	0	$20,000	0	$20,0(
Street Sweeping	2.75	$288,300	2.75	$288,3
Private Facilities Maintenance Inspections Under Chapt. 13.25	0.03	$2,770	0.03	$2,77
Roadside Herbicide Use	0	$48,385	0	$48,3(
Decant Facility Operation	0	$50,000	0	$50,0(
Small Drainage Capital Projects	0	$630,000	0	$630,0
Catch Basin, Pipe and Manhole Cleaning	2	$156,629	2	$156,6
Litter Removal	1.5	$185,354	1.5	$185,3
Roadside Ditches and Culverts Maintenance	7	$695,690	7	$695,6
Bridge Maintenance	2	$171,460	2	$171,4
TOTAL:	**19.78**	**$2,581,536**	**19.78**	**$2,581,**

PROPOSED

	CURRENT (1998)		YEAR 1	
NAME	**FTE**	**COST**	**FTE**	**COS**
Increased Street Sweeping	0	$0	1	$140,0
Improved Biofiltration Swale Maintenance	0	$0	1	$130,0
Maintain Retention/Detention Facilities to Co. Standard	0	$0	2	$200,0
Review Chemical Weed Controls	0	$0	0	$0
Comprehensive Private Facilities Inspection	0	$0	0	$0
O and M Tracking System and Standards	0	$0	1	$90,0(
Yearly Manhole Inspection	0	$0	0	$0
Yearly Catch Basin Inspection and Cleaning	0	$0	0.75	$90,0(
Expanded Roadside Mowing		$0	3	$405,9
Establish Storm Sewer Maintenance Standards	0	$0	0.05	$4,10
Drywell Inpsection/Cleaning at 3 - 5 Years	0	$0	0.25	$40,0(
Inspect and Maintain Road Ditch and Culverts	0	$0	2	$166,0
TOTAL:	**0**	**$0**	**11.05**	**$1,266,**
PROGRAM TOTAL:	**19.78**	**$2,581,536**	**30.83**	**$3,847,**

SUMMARY OF REVENUE SOURCES BY YEAR
OPERATIONS AND MAINTENANCE

CURRENT

SOURCE	*CURRENT* (1998) REVENUE	*YEAR 1* REVENUE	*YEAR 2* REVENUE	*YEAR 3* REVENUE	*YEAR 4* REVENUE
ROAD FUND	$2,578,766	$2,578,766	$2,578,766	$2,578,766	$2,578,766
STORM SEWER SERVICE FEES	$2,770	$2,770	$2,770	$2,770	$2,770
TOTAL:	**$2,581,536**	**$2,581,536**	**$2,581,536**	**$2,581,536**	**$2,581,536**

PROPOSED

SOURCE	*CURRENT* (1998) REVENUE	*YEAR 1* REVENUE	*YEAR 2* REVENUE	*YEAR 3* REVENUE	*YEAR 4* REVENUE
UNKNOWN	$0	$1,266,000	$999,950	$997,450	$997,450
TOTAL:	**$0**	**$1,266,000**	**$999,950**	**$997,450**	**$997,450**
PROGRAM TOTAL:	**$2,581,536**	**$3,847,536**	**$3,581,486**	**$3,578,986**	**$3,578,986**

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County Maintenance Responsibilities

Feature	BBC	Salmon Cr Lakeshore	Countywide
Linear feet of curb and gutter	Unknown	Unknown	Unknown
Miles of mowable slopes	Unknown	Unknown	Unknown
Bridges			71
Miles of roadside ditch	Unknown	Unknown	Unknown
Miles of tight pipe			at least 181.8
Miles of perforated pipe			at least 25.3
Miles of drainage ditch	Unknown	Unknown	Unknown
Culverts	Unknown	Unknown	Unknown
Catch basins			at least 5443
Manholes			at least 2423
Buried or inaccessible manhole or drywell			at least 294
Pumps	2		2
Drywells			at least 881
Linear feet of biofiltration swale	7,500	Unknown	Unknown
On site retention/detention basins	24	Unknown	Unknown
On site drainage trench facilities	Unknown	Unknown	Unknown
Regional facilities	2	Unknown	Unknown
Private facilities inspections	40	Unknown	40

CURRENT AND PROPOSED MAINTENANCE PROGRAM

Street Sweeping

Street sweeping is performed to remove sediment, trash and debris from roads and curb gutters. Street sweeping serves aesthetic and environmental purposes. Trash and sediment captured by street sweeping does not enter catch basins or the aquatic environment. Reducing the amount of sediment trapped in catch basins is important because catch basins are expensive to clean and the sediment is difficult to properly dispose of. Sweepers are also used in emergency situations to clean up leaves and sediment that plug inlets and cause flooding.

Street sweeping is tracked by a map of sweeper areas that are part of the County GIS system. Sweepings are screened to remove trash and litter and then used as landfill to reclaim an exhausted County gravel pit.

Increased street sweeping is proposed. There are several reasons for increased street sweeping. Along with possible aesthetic and environmental improvements, overall costs may be reduced by sweeping up material that would otherwise be trapped in catch basins. Catch basin sediment and water is treated in a decant facility that includes cost for sewer fees and waste disposal and testing fees for sediment. Sweepings can be used as fill material in abandoned gravel pits.

Deicing

The County policy is to minimize the use of de-icing chemicals. In most cases sand is spread on roads to provide traction. About 1,200 cubic yards of sand is used each year. About 50 percent is retrieved by sweepers and about 50 percent is swept onto road shoulders. There is no plan to change the current practice. Deicing chemicals are used to prevent ice from forming in a number of problem spots such as stop lights and steep hills in the urban area. The de-icing chemical, magnesium chloride, is purchased from the Washington Department of Transportation.

Spill Response

Public Works responds to small spills of oil, coolant, and fuel from vehicle collisions. Absorbent is spread on the spill to collect the liquid. When feasible, the absorbent is swept up and disposed of with street sweepings. All other spills are referred to the Department of Ecology. Operations will develop a more comprehensive spill response procedures during the first year of the permit term.

Roadside Mowing

Roadsides have grassy slopes. Some are mowed to improve aesthetics and prevent the growth of shrubs and blackberries that choke out grass. Roadsides are mowed between the ditch and pavement three or four times per year.

Increased mowing is proposed. The increase would add extended arm mowers capable of reaching slopes between the ditch and right-of-way boundary.

Bridges

Bridges are maintained like roads. Gutters and drains need to be periodically inspected and cleaned for sediment, trash and debris. Bridges are serviced two times per month. There is no plan to change from current practices.

Roadside Ditches and Culverts

Roadside ditches with culverts for driveway and road crossings are the principal drainage system in rural Clark County and older, low density urban areas. Ditches along roadways are used to convey runoff from roads and adjacent property. In some areas, roadside ditches also serve to drain shallow groundwater. Generally, ditches are lined with grass but often contain wetland vegetation such as cat tails if they are groundwater drains. Ditches can function to trap sediment and pollutants. Ditches can also permit infiltration to goundwater.

Culverts are short sections of pipe that convey stormwater or stream flow short distances under roads, driveways, and rail lines, or across areas where ditch erosion is a problem. Culverts can include large pipes or concrete structures where streams pass under roads. Culvert pipes are not all mapped and are not separated from other pipes in the GIS stormwater maps. Therefore the number of culverts is

unknown. Maintenance is performed to prevent culverts from becoming plugged, and includes removing sediment and debris and making minor repairs and is performed as needed.

Roadside ditches are maintained as needed to remove debris and sediment to provide effective stormwater drainage. Sediment removal can expose soil in ditches, which may then erode. Because of this, ditch maintenance practices are intended to minimize erosion.

Ditch and culvert maintenance will be changed from being performed in response to complaints to a systematic program of inspection and maintenance. The shift to an inspection and maintenance program may reduce the number jobs where large amounts of sediment is removed. The program will also improve drainage capacity of ditch systems.

Litter Removal

Roadside litter is collected by crews of County work release inmates.

Vegetation Control on Roadsides

The County policy is to minimize the use of herbicides while effectively controlling problem vegetation. Herbicides are used to control vegetation on roadside shoulders and right-of-way. The County contracts with the Washington Department of Transportation to spray roadside shoulders along approximately 300 miles of arterial roads and major collectors each year. The WDOT spraying is intended to kill vegetation within a foot of the pavement to prevent sediment accumulation. The County contracts to have weeds sprayed on medians and in cracks prior to pavement overlays. The County also contracts with the Clark County Weed Control Board to spot spray noxious weeds on County right-of-way.

Storm Sewer Pipe

Storm lines are found in most of the urbanized areas of the County and discharge to streams, ditches, wetlands, drywells, drainage trenches and open fields. Often, storm sewer pipes or culverts alternate with natural channel and drainage ditches along the course of small streams passing through older commercial and residential areas. To maintain hydraulic capacity pipes have sediment and debris removed, TV monitoring, and minor repairs as needed. Approximately 50,550 lineal feet of pipe are cleaned each year.

Pipe maintenance will shift to an inspection and maintenance program. Such a program would reduce the frequency of pipe obstructions and reduce the amount of sediment flushed through pipes during clearing of obstructions.

Drainage Ditches

In some areas, man-made ditches convey stream flow in place of natural channels and wetlands. The Burnt Bridge Creek Utility maintains drainage ditches draining low-lying areas in Upper Cold Creek. Elsewhere, drainage channels are maintained by the owner, which may be private, a drainage district, or the County if the drainage ditch is on County right-of-way. Drainage ditches are maintained as needed to prevent flooding due to vegetation growth or sediment accumulation. Trash and debris are also removed from the ditches. Drainage channels are maintained as needed.

Natural Channels

Natural channels include the streams and ravines that convey normal base flow and stormwater runoff. Maintenance activities include removing debris and obstructions at bridges and culverts. Bank stabilization is also performed in some cases where property or public safety are at risk.

Catch basins

Catch basins are sumps at stormwater inlets that are intended to trap sediment and debris in stormwater. Many catch basins have inverted outlet pipes intended to trap oils and floating debris. Maintenance is performed to remove sediment and trash from the storm sewer system and to prevent plugged inlets. Maintenance includes periodic removal of the sediment, debris and any water trapped in the catch basin. Sediment and water are transported to the decant facility where water is separated from sediment, treated, and discharged to sanitary sewer. Sediment is stock piled for future disposal or recycling.

About 3,200 catch basins are cleaned each year, or an overall average of about once every two to three years per catch basin. Catch basin cleaning at an interval of at least once per year to as often as quarterly is considered necessary to limit sediment in streams.

Yearly catch basin inspection and cleaning will be initiated. Inspection will provide better tracking of the amount of sediment accumulation.

Manholes

Manholes are 4 foot to 8 foot diameter vertical concrete pipes that join sections of storm drainage pipe. Along with connecting pipe sections and any hydraulic design function, manholes provide access for pipe cleaning. Manholes are cleaned as needed to prevent loss of hydraulic capacity.

In conjunction with catch basin cleaning, many of the manholes will be inspected annually.

Pumps

Pumps are used temporarily and permanently to slowly remove water from closed depressions where property flooding is a problem and low-lying detention ponds. Two permanent pumps are operated and maintained by the Burnt Bridge Creek Utility.

Drywells

Drywells are used to dispose of stormwater by infiltrating it into the ground. They are simply open-bottomed, deep manholes that have "weep holes" in the sides. Drywells are widely used in Clark County for several reasons: compared to pipe systems, they are an inexpensive method to prevent flooding caused by runoff; many areas are underlain by gravely soils that can rapidly infiltrate stormwater; and they can be used to dispose of runoff in closed topographic depressions or very flat areas where gravity draining pipes are not feasible or do not exist.

Drywells are maintained to sustain discharge capacity. Cleaning frequency is approximately once every 12 years or when a plugged drywell causes street flooding. Drywell maintenance includes inspection for sediment accumulation, sediment removal using a vacuum truck, periodic removal of sediment from weep holes, and in some cases replacement of a plugged drywell. Sediment and water from drywell cleaning are delivered to the County decant facility.

Buried drywells will be uncovered and cleaned as a part of routine maintenance. Cleaning would increase to a three to five year interval if yearly catch basin inspection and cleaning is funded.

Drainage Infiltration Trenches

Drainage trenches are subsurface stormwater infiltration systems that consist of a perforated pipe buried in a gravel-filled trench. These need to be periodically flushed or cleaned to remove sediment in the perforated pipe.

Biofiltration Swales

Biofiltration swales are grass-lined flat bottom ditches designed to treat stormwater by trapping sediment and pollutants. There is no complete biofiltration swale inventory. Swales must be properly maintained to provide the design purpose of treating stormwater. Maintenance includes mowing 3 to 4 times per year, and occasional sediment removal.

Biofiltration facilities are currently being inventoried.

Increased maintenance would be performed on biofiltration swales that includes 4 annual mowings, clippings removal, sediment removal and reseeding of bare spots, and debris removal.

Detention Ponds and Retention Basins

Detention ponds are employed to reduce flooding by storing stormwater and metering it out slowly at reduced flow rates. Detention ponds can be wet all year round or drain between wet periods. Retention basins are intended to trap a specific volume of runoff and infiltrate it into the ground. Some of these facilities include constructed wetlands that provide water quality treatment and habitat.

There are an unknown number of detention and retention basins. Records are being reviewed during summer of 1998. Forty are within the Burnt Bridge Creek Utility.

Facilities are maintained for aesthetics and to preserve the designed hydraulic functions. Periodic maintenance includes mowing, inspection for erosion or other problems, removing debris, and removing sediment.

Facilities will be maintained to County standards for private facilities.

Vegetation Control for Stormwater Control Facilities

Weeds are removed to maintain aesthetics and prevent exotic plants from overwhelming desirable plants. Only mechanical weed removal is used. No changes are planned.

MANAGEMENT TRACKING

Maintenance Tracking

Maintenance tracking is usually performed separately by each activity. Often, work is in response to complaints as opposed to a routine schedule.

Storm Sewer Maintenance

Sweeper areas are used as a tool to track catch basin cleaning. No computerized maintenance tracking system is in place.

The County will establish a computer-based maintenance tracking program, linked to an inspect and maintain approach is a priority for the O and M program. The maintenance tracking program should be linked to the GIS storm sewer inventory.

Road Maintenance

Sweeper areas are used to track street sweeping. Relevant road maintenance activities should also be included in the proposed tracking system.

Complaint Tracking and Response

Burnt Bridge Creek Utility complaints are logged and responded to by the Public Works storm drainage maintenance crew. Complaints to Operations are logged by Operations and responded to by Operations.

County Storm Sewer Mapping

Public Works, Community Development and the Department of Assessment and GIS and Assessment are working toward a unified program to map drainage systems and connect them to County parcel maps. Funding for this program is limited. The purpose of the mapping is to provide basic information for the CIP, to better plan and conduct maintenance operations, and provide preliminary locations of existing storm sewers for construction planning.

The GIS maps will be updated from field information, archived engineering plans, and new as-built plans for development projects and County projects. Complete drainage systems will be mapped including open channels not currently in the database. If funding is available, roadside ditch culverts will be added.

PRIVATE FACILITIES MAINTENANCE

Under Clark County stormwater code (Section 13.25.230) privately operated stormwater facilities are required to have operation plans. In the Burnt Bridge Creek Utility area, the County performs an annual inspection in the late fall or early winter to assure compliance with the management plans. A standard inspection checklist is used for each visit.

Maintenance standards should be described in the Technical Information Report prepared as a condition of approval under the Stormwater Control Ordinance. If for some reason no maintenance plan is recorded, the County maintenance standards are applied. Maintenance standards are included in Policy and Procedures: Stormwater Facilities Maintenance Policy, April 23, 1996, Department of Community Development.

Maintenance standards will need to be expanded to include all types of storm sewer structures. King County's new design manual has an appendix that outlines maintenance requirements for private facilities.

The process to correct unacceptable maintenance in Burnt Bridge Creek basin has several steps: 1) the owner is notified in writing of the needed corrections, 2) if corrections are not made the County will perform the needed maintenance and bill the owner under provisions of Section 32.04.060 CCC.

Outside of the Burnt Bridge Creek Utility area, maintenance is driven by complaints and no system of inspection is in place.

Changes to County code giving the County authority to require maintenance of all private facilities are discussed in the Regulatory Program.

An additional full time technician will be added to perform all private facilities inspections, respond to complaints, provide technical assistance for storm sewer maintenance, and perform follow-up inspections.

Private Storm Sewer Inventory and Mapping

A program is proposed in the Regulatory Section of Chapter 3 that describes establishing a private storm sewer system inventory and a program to track private facilities maintenance.

FACILITIES ACCEPTANCE/FINANCIAL GUARANTEE PROGRAM

The County requires a two-year maintenance bond for storm sewer improvements that are in County roads or easements. Also, any residential subdivision may donate stormwater control facilities along with the underlying land to the County. Currently, there is a limited program that begins with notification of Development Engineering staff several months before the maintenance bond expires. Prior to release of the maintenance bond, County engineering staff perform a visual inspection to verify that the facility has been maintained and is not apparently failing.

An enhanced program to assure that facilities planned for dedication to the County function as designed is described in the Regulatory Section.

SMALL CAPITAL PROJECTS

Small projects are storm sewer repairs or projects to address a drainage problem. These projects generally cost less than $10,000 and require minimal engineering design. Examples include culvert and drywell replacements.

DECANT FACILITY OPERATION

Sediment and water pumped from catch basins and drywells must be managed to prevent pollutants from entering the environment. This is accomplished by decanting the liquid and treating it prior to discharge to sanitary sewer. The remaining sediment is stock piled for safe reuse.

The County decant facility currently receives vacuum truck wastes from County catch basin cleaning and drywell cleaning. In the future, the Washington Department of Transportation and the City of Vancouver operations and maintenance programs plan to use the facility. The conditional use permit for the facility limits the users of the facility. The facility is centrally located in the Orchards area.

MONITORING AND EVALUATION

PROGRAM OVERVIEW

Monitoring and evaluation is conducted largely by the Public Works Department, Environmental Services Division. Additional county-financed monitoring to meet Endangered Species Act (ESA) requirements needs may be performed by other departments or contractors. Prior to the NPDES permit program, monitoring activities include stormwater control device testing, stream flow gauges, rainfall gauges, storm sewer facility inventory, and habitat monitoring.

The currently undefined requirements for ESA protection of threatened salmon and trout, and uncertain funding sources for stormwater runoff management, make proposing a specific monitoring program unrealistic.

Depending on funding, new monitoring activities for the permit include characterization of receiving waters, basin management evaluation, storm sewer system mapping and description, monitoring and inspection to identify and correct stormwater problems, creation of a central data repository, and stormwater BMP testing.

Evaluation activities will be part of the NPDES permit actions and may include evaluation of regulatory programs, establishing tracking systems for storm sewer operation and maintenance, and preparing annual and four year reports required by the permit.

Coordination is an important monitoring program component because environmental monitoring is an activity that can consume relatively large amounts of money and also meet information needs of more than one program or agency. Monitoring for watershed characterization to address fish habitat issues will likely involve a number of agencies and groups. Clark County may take some role in these activities. Coordinated efforts have included working with Clark Public Utilities. Possible significant partnerships that will be explored during the permit term include setting up a project using students and faculty from Washington State University's Vancouver Campus, linking with watershed analysis performed by State and local efforts to protect endangered salmon and trout, and other local partners such as Clark Public utilities, the Washington Department of Transportation, and the Clark County Conservation District.

Monitoring Activities and Permit Requirements

Monitoring and evaluation activities are performed to meet several permit requirements. Chapter 4 lists the permit requirements and any activities from this chapter that apply.

SUMMARY OF FTE ANI
MONITORING AND I

CURRENT

	CURRENT (1998)		YEAR 1	
NAME	**FTE**	**COST**	**FTE**	**COS**
Stormwater Facility Inventory and Mapping	0.25	$25,000	0	$0
NPDES Administration and Permit Application	1.5	$123,000	1	$82,0(
BBC and Salmon Creek Stream Gauges	0.12	$13,000	0.12	$13,0(
Rain Gauge Operation	0.02	$2,000	0.02	$2,00
Burnt Bridge Creek Stream Samping	0.05	$7,000	0.05	$7,00
Stream Gauge Station on Lacamas Creek	0.1	$7,700	0.1	$7,70
Lacamas Continuous Water Quality Sampling	0.2	$17,000	0.2	$17,0(
Lacamas In-Lake Studies	0.1	$10,000	0.1	$10,0(
Baseline Wildlife and Habitat Survey	0.2	$20,000	0.2	$20,0(
Stormceptor BMP Testing	0.1	$16,000	0.05	$7,00
TOTAL:	**2.64**	**$240,700**	**1.84**	**$165,7**

PROPOSED

	CURRENT (1998)		YEAR 1	
NAME	**FTE**	**COST**	**FTE**	**COS**
Crest Gauge Monitoring	0	$0	0.1	$7,00
NPDES Data Maintenance	0	$0	0.5	$42,0(
Storm Sewer Mapping System	0	$0	1	$82,0(
Outfall Screening Project	0	$0	0.07	$5,00
Add Stream Gauges for Hydrologic Analysis	0	$0	0	$0
Shallow Groundwater Quality Investigation	0	$0	0.05	$5,00
Watershed Characterization	0	$0	0	$0
Annual Permit Reports	0	$0	0.1	$8,20
Regulatory Program Monitoring	0	$0	0.2	$16,2(
Add Monitoring to Public Outreach Activites	0	$0	0.25	$25,0(
Add Rain Gauges for hydrologic analysis	0	$0	0	$0
TOTAL:	**0**	**$0**	**2.27**	**$190,4**
PROGRAM TOTAL:	**2.64**	**$240,700**	**4.11**	**$356,1**

SUMMARY OF REVENUE SOURCES BY YEAR
MONITORING AND EVALUATION

CURRENT

SOURCE	*CURRENT* (1998) REVENUE	*YEAR 1* REVENUE	*YEAR 2* REVENUE	*YEAR 3* REVENUE	*YEAR 4* REVENUE
GENERAL FUND	$28,675	$28,675	$8,675	$8,675	$1,925
GRANTS	$42,025	$33,025	$32,025	$26,025	$5,775
ROAD FUND	$148,000	$82,000	$26,000	$26,000	$42,000
STORM SEWER SERVICE FEES	$22,000	$9,000	$9,000	$9,000	$9,000
UNKNOWN		$13,000	$13,000	$13,000	$40,000
TOTAL:	**$240,700**	**$165,700**	**$88,700**	**$82,700**	**$98,700**

PROPOSED

SOURCE	*CURRENT* (1998) REVENUE	*YEAR 1* REVENUE	*YEAR 2* REVENUE	*YEAR 3* REVENUE	*YEAR 4* REVENUE
UNKNOWN	$0	$185,400	$502,400	$637,400	$629,200
ROAD FUND		$2,500	$12,500		
GRANTS		$2,500	$12,500		
TOTAL:	**$0**	**$190,400**	**$527,400**	**$637,400**	**$629,200**
PROGRAM TOTAL:	**$240,700**	**$356,100**	**$616,100**	**$720,100**	**$727,900**

Unmet Monitoring Needs

The current monitoring program has been geared toward collecting long term stream flow and rainfall data and monitoring specific to a particular problem or investigation. The needs for stormwater management are broader and address characterization of the resources, identifying and removing specific pollutant sources, and tracking program activities. Monitoring to create better hydrologic models is critical to cost effective capital improvement projects. The following table summarizes monitoring needs and unmet needs.

Conversations with Ecology and internal discussions have identified several primary activities for the first permit term.

1) Storm Sewer Inventory - Complete the storm sewer GIS inventory and establish a program to maintain it.

2) Continuous Hydrologic Model Development and Support - Gathering and compiling data to create continuous hydrologic models for Clark County river basins is required to develop adequate controls for stormwater runoff. Much of the data to create models is currently available but an evaluation will be required to determine if it is sufficient for the needs of the models. A program to collect additional stream flow and rainfall data is likely to be needed.

3) Pollutant Reduction - Monitoring to identify and remove pollutant sources is a priority for NPDES because the intent of the permit is to reduce pollutant loads.

4) Watershed Characterization - Defining the health of stream and wetland habitat is an important activity to prioritize stormwater management actions. Types of data gathering include surveys to categorize riparian habitat, studies of benthic invertebrate communities, and fish surveys. Nutrient loading estimates are being completed for Lacamas Lake.

5) Basin Management Evaluation - Long term monitoring of stream health will help determine if programs are having an influence.

6) CIP Monitoring - Large capital projects should include monitoring investigations to aid design and assess performance.

7) BMP Monitoring - One BMP, a Stormceptor treatment manhole is being monitored as a retrofit device for intensive urban land uses.

8) Program Effectiveness - Annual and four-year reports are prepared for Ecology. Regulatory program evaluation is also considered.

9) Data Management - A centralized and standardized data management and reporting system is needed.

ONGOING AND PROPOSED MONITORING ACTIVITIES

The monitoring is divided into ongoing activities, currently being performed by a variety of projects and a proposed program that will largely integrate many watershed characterization and monitoring actions.

Monitoring to Identify and Correct Stormwater Problems

Ongoing

Storm Sewer Mapping

Computerized storm sewer mapping is being compiled for several types of drainage features. The mapping is included in the monitoring program because it is primarily a data acquisition program. Once completed the database is accessible to other users, it can then be used for tracking maintenance, tracking pipe to possible pollutant sources, locating storm sewers in the field, and modeling storm flows for CIP designs.

Much of the County storm sewer system is mapped at a preliminary engineering level. The mapping includes chiefly County-owned pipes, outfall points, catch basins, manholes, and drywells, control facilities, swales, and some ditches in the urban area. The stormwater database is set up so that data can be linked to line and point maps via a unique identification number for each feature such as manhole, pipe length or catch basin.

Private systems are not inventoried or mapped as are most County operated ditches, swales and control facilities. The database lacks many features that make it functional such as having a completely connected line system within each stormwater drainage basin.

Proposed Storm Sewer System Mapping and Inventory

Program to Complete and Maintain Storm Sewer System GIS Map

A program will be initiated to fill gaps in the mapping of County operated storm sewers. Primary activities will be inventory and mapping of stormwater flow control and treatment facilities, adding new construction to the database, and filling gaps in the database where pipes or drainage ways are not connected or lack a correct outfall point.

New storm sewer systems will be added to the GIS maps and as built plans will be scanned and archived on CDs or other easily retrievable media.

During the permit term, all County operated facilities will be mapped and described in a GIS database. Facility design and level of performance should be described. The purpose is to identify the best use for each facility for possible renovation under the CIP. The description of all stormwater facilities should include:

- Location of the facility;
- Description of the size and type of the facility
- Components of the facility;
- Cataloging the design functions of each component;
- Visual observation of the facility performance; and
- Comparison to the design function.

Descriptions will help address BMP effectiveness for controlling excess flows, pollutant control for existing conditions and local flooding.

Private Facility Mapping

Private storm sewer facilities may discharge to county storm sewers, surface water or groundwater. A program to map and inventory private storm sewer systems will be started.

The Drywell Management Program began a private infiltration facility mapping project in 1996. This project is partially completed. Work that may be performed includes mapping facilities outside of Burnt Bridge Creek, completion of infiltration facilities mapping in upper Burnt Bridge Creek, and adding all mapping to the GIS storm sewer database.

Private storm water control facilities that discharge to the County storm sewer are not inventoried. Facilities approved under Chapter 13.25 are required to perform a maintenance program subject to inspection and enforcement by the County. These facilities are listed but not mapped. Many infiltration facilities and pipe systems are not inventoried in any way.

Pollutant Source Identification

No ongoing program exists at the time of permit submittal. Source identification includes visual description and periodic testing of outfalls, pipes and urban streams to identify problem areas and specific sources of pollutants. Follow-up work includes tracing non-stormwater discharges to their source.

Proposed Program

The following activities will be performed during the permit term on the schedule agreed to by Ecology and Clark County.

Outfall Screening

Establish a program to screen outfalls for pollutant discharges and identify upstream sources. This will include the outfalls identified as having possible non-stormwater discharges by the Part 1 Application dry season inventory.

All outfalls that had an indication of non-stormwater flow in 1995 or currently have commercial/industrial land use should be screened. Possibly, outfalls will be tested for E. coli or enteroccus.

Urban areas having both shallow groundwater and relatively large numbers of septic systems should be screened. Outfalls mapped subsequent to the 1995 field screening should also be checked after a prioritization process based on land use.

Maintenance Inspections

Periodic private facility maintenance inspections will be performed as an Operations Division activity. These inspections will probably uncover and eliminate many pollutant sources.

Receiving Water and Watershed Characterization, Basin Management Effectiveness and Hydrologic Model Development

Ongoing Activities

Continuous Stream Gauges

Public works operates two stream gauges on Salmon Creek. One gauge is operated on Lacamas Creek by the Lacamas Lake Restoration Program as a continuous water quality monitoring point. A stream gage is also proposed for the lower East Fork Lewis River contingent on cooperative funding. Stream gauging is also performed by Clark Public Utilities (two gauges on Salmon Creek), the U.S. Geological Survey (one gauge on the upper part of the East Fork of the Lewis River), and by dam operators on the Lewis River. Clark Public Utilities and the County share stream flow data. Flow gauges on Burnt Bridge Creek that were historically operated by the County are now operated by the City of Vancouver following annexations in 1997.

Rainfall Monitoring

Rainfall data is collected by the Public Works Department, Washington State University, NOAA and several private citizens. County stations electronically record rainfall depth at short time intervals while the other stations record daily totals. Data is currently tabulated by the County for its own gauges.

Burnt Bridge Creek Utility Ambient Monitoring

The Burnt Bridge Creek Utility has monitored several sites, using monthly grab samples, for over 20 years. Currently, monitoring on Burnt Bridge Creek is performed by the City of Vancouver.

Lacamas Lake Loading Model

A loading model that can evaluate land use and land management alternatives for nutrient loading to Lacamas Lake was developed in 1998. The model will be refined using data collected by the Lacamas Lake Restoration Program.

Lacamas Lake Restoration Program Storm Event Sampling

Storm event sampling and continuous monitoring are performed at one station to the characterize storm effects and provide data for estimating pollutant loads to Lacamas Lake. Results will be used to update the loading model.

Lacamas Lake Monitoring

Water quality monitoring is performed at one station in Lacamas Lake during the April to November growing season.

Lacamas Lake Special Investigations

Special investigations of Lacamas Lake are planned to evaluate the potential for success of various in-lake management options. The plans for these investigations are not yet completed.

Baseline Riparian Habitat Monitoring

Clark County areas will be surveyed for species of fish, amphibians, reptiles, small mammals and birds in 1998 and 1999. The main goal of the survey is to determine presence and absence of species. Endemic state and federal species of concern will also be surveyed. Approximately 40 permanent plots will be established on public and private lands to monitor neotropical birds and small mammals.

Description of this activity is included as information about Clark County stormwater or resource protection programs. It is not a required part of the NPDES Stormwater Management Program.

Wetlands Mapping

Wetlands are mapped at a reconnaissance level for some areas as a part of watershed planning. Currently, Burnt Bridge Creek has been mapped and added to the watershed planning database. Parts of Salmon Creek have been mapped.

Description of this activity is included as information about Clark County stormwater or resource protection programs. It is not a required part of the NPDES Stormwater Management Program.

Proposed Receiving Water and Watershed Characterization, Basin Management Effectiveness and Hydrologic Model Development

This program will be developed in detail following initiation of a dedicated revenue source and clarification of the requirements for programs to meet requirements of the Endangered Species Act. The descriptions in this section describe activities that should be included in the program using King County's program as a model. The King County program is however a mature ongoing program. Several years of intensive effort were required to evaluate basins and establish their current program to monitor changes in the watersheds.

Specific monitoring projects are not possible to describe at this time because monitoring objectives have not been defined. Initial activities will focus on baseline assessments. Examples include benthic macro invertebrate sampling, adding stream gauges and channel characterization.

Channel and Habitat Characterization

Physical measurements of streams and assessments of habitat provide information describing the effects of capital projects, regulations, and watershed management on streams. They also provide an initial assessment of the stream's quality. Physical measurements can include channel cross section measurements, profiles, and pebble counts. Habitat parameters quantified during channel measurements include assessments can include channel imbeddedness, presence and quantity of woody debris, and percent canopy cover.

Purpose

Stream channel and habitat assessments are used as a direct measure to compare with environmental factors such as percent vegetated stream corridor or percent impervious area. Cross sections measure scour and fill. Longitudinal profiles measure important fish habitat parameters such as pool-riffle sequences and pool depth. Pebble counts measure sediment size distributions which are an important measure of spawning gravel quality and can track changes in sediment texture with time.

Schedule

Stream reaches should be selected for monitoring in order to assess their response to a specific type of land use activity and as reference sites in relatively undisturbed areas. The Salmon Creek survey by Harvester and Wille (1988-1989) should be reviewed for sites to revisit. Reference and land use indicative sites should be found using available land use urban impact indices and land use information.

Fish Surveys

The King County program uses a system of "spot" and "walking" surveys to find out if streams are salmon bearing, if certain species are present, and to describe the use of spawning habitat. This activity can make us of volunteers. Along with surveys, estimates of escapement, juvenile counts, presence or absence for particular basins are tabulated, as well as compiling Washington Department of Fish and Wildlife escapement data.

Purpose

Fish surveys aid in allocation of capital and management resources to improve fish habitat. They also are used to monitor the success of specific management activities.

Schedule

Existing data should be compiled and sites selected.

Hydrology

Two types of gauges are used: continuous rainfall gauges and continuous stream-flow gauges. Stream gauges measure stream stage to estimate discharge using the stage discharge relationship at that site.

Purpose

Stream gauges collect measurements that can be used for several purposes. They can measure the change in flows in a developing basin. Capital project performance can be measured by putting stream gauges downstream. Stream flow data is used to estimate flood return intervals. Stream and rainfall gauge information is required to calibrate continuous hydrologic modes that will be key to future basin planning and regulatory programs. Continuous models can predict flows (including base flow) in watersheds for differing proposed development scenarios, as well as estimate the capacity required for capital projects and retention/detention facilities.

Schedule

Additional gauges are contingent upon the yet unknown needs for support of the continuous hydrologic models for Clark County. Currently operated gauges will be reviewed. Burnt Bridge Creek stream gauge were transferred to the City of Vancouver.

Land Use and Land Cover Analysis

Land use parameters include proportions of differing land use types in a basin, percent impervious area, and percent of differing land cover such as forest and grassland, and riparian habitat widths. These features are tabulated in a GIS and are usually measured from aerial photographs or tax records for individual parcels. Urban impact indices also include stream crossing density, road density, stormwater outfalls per length of stream (May 1996).

Purpose

Land use and cover information is used to select and evaluate monitoring sites. The land use/cover should be compared to other monitoring information for correlations and to assist management decisions. Since many activities of the County involve land use changes or controls, this information is an important part of the decision making process. Also, it provides some measure of the effectiveness of programs to protect habitat.

Schedule

County land use mapping is periodically updated using assessor's parcel land use. Other measures will be evaluated and developed as needs and priorities are defined. This should be one of the first actions of the overall monitoring program.

Macro Invertebrate Sampling

Benthic macro invertebrates surveys are collections of aquatic insects. Bottom-dwelling macro invertebrates are becoming recognized as excellent indicators of stream quality in terms of both physical conditions and water quality. A standardized biotic index can be assigned based on species presence, abundance, and diversity. While these surveys follow a rigorous protocol and require an expert to type the specimens, this may be a good program for using supervised volunteers to perform field work.

Purpose

Macro invertebrate surveys can be an important tool to assess cumulative watershed impacts and where traditional water quality and physical measurements may not reveal true stream impacts. Index scores based on macro invertebrates have been proven to respond to cumulative watershed impacts ranging from increased sediment, excess flows, water quality, and habitat degradation. This makes them a useful indicator of current health of streams and well as a tool for long-term evaluation of watershed management programs.

Schedule

Sites may be selected in the first or second year and the first survey should be completed in the fall of the first or second year. Sites should coincide with channel and habitat survey areas if possible.

Water Quality Testing

Water quality monitoring can storm monitoring and grab samples. Environmental Services is attempting to coordinate monitoring activities.

Purpose

Water sampling is used to estimate pollutant loads, testing is relevant to identifying particular sources of pollution, and ambient monitoring collects data describing the basic quality of a stream. Monitoring can provide insight about effectiveness of regulations and watershed management. Monitoring is a direct measure to determine if a stream or lake meets state standards for uses such as recreational use or habitat.

Schedule

Aside from projects in Lacamas basin, sampling will likely consist largely of periodic grab samples to address a specific pollution issue. One area of particular concern may be testing summer base flow from County outfalls for pathogenic indicators such as E. coli.

Wetlands Monitoring

Clark County does not monitor wetlands. Monitoring parameters can include water quality, amphibian populations, vegetation type, and wildlife populations. This may be another area where volunteers can perform field observations.

Purpose

Wetland monitoring can be used to investigate wetland function in a priority basin. The CIP may include constructed wetlands as combination stormwater control facilities and habitat amenities whose function needs to be monitored as part of a program to better understand and improve them. Wetland area and type can be monitored to assess net changes in a basin's wetlands with time. This is similar to land cover monitoring.

Schedule

Wetland mitigation agreements under the County code require monitoring plans. These need to be periodically field checked. CIP monitoring may be included. Implementation depends on program priorities.

Stormwater BMP Monitoring

Drywell Management Program Stormceptor Retrofit Testing

The Drywell Management Program, partly funded under a Washington Department of Ecology Centennial Grant, is attempting to test the efficacy of proposed drywell retrofit devices. A Stormceptor, which functions as an off-line oil/water separator and sediment trap is scheduled for installation at the Clark County 78th Street Operations Center. The Stormceptor appears to be a viable retrofit for spill control and sediment at high traffic and vehicle maintenance facilities. The purpose of the testing is to evaluate the treatment for a variety of runoff flow rates.

Agricultural BMP Inventory and Monitoring

In 1995, the Lacamas Program conducted a review of program sponsored BMP installations. The review assessed the effectiveness of each constructed project, providing maintenance and operational feedback to program staff. Program staff are currently updating the 1987 inventory of priority farms to reflect changes in land use over the past ten years. The updated inventory will be used to re-focus BMP implementation efforts on remaining high priority farms.

Description of this activity is included as information about Clark County stormwater or resource protection programs. It is not a required part of the NPDES Stormwater Management Program.

Adding Monitoring to Public Involvement Programs

County public involvement programs currently lack a component to perform systematic environmental data collection. In conjunction with developing a stronger stormwater public outreach program, County support for monitoring activities will be developed and implemented. Successful programs from other areas will be reviewed as a model for Clark County's actions. This is a public involvement tool, not a monitoring program to meet permit monitoring requirements.

Program Effectiveness, Administrative Activities

Current Program Effectiveness, Administrative Activities

O and M Monitoring

Currently, the Operations Division has a variety of systems for tracking activities.

Stormwater Control Facilities Acceptance

Historically, monitoring of stormwater facilities for failure is largely through complaints from the public or observations by the Operations Division field staff. In 1998, Community Development and Public Works established a limited program to better track facilities during their maintenance bond prior to final acceptance for County maintenance. Acceptance is performed as a regulatory program activity.

Proposed Program Effectiveness and Administrative Activities

NPDES Permit Annual Report

The permit is expected to include a variety of annual reporting requirements:

1. Status of implementing the components of the stormwater management program;
2. Notification of annexations that change the permit area and their implications for the permit;
3. Differences between planned and actual expenditures for the reporting period with a breakdown by component and a budget for the following year;
4. Revisions to the remaining years of the approved SWMP fiscal analysis;
5. For the Fourth Year report, a summary of monitoring data;
6. A summary of compliance activities including the nature and number of enforcement actions, inspections and types of public education activities;
7. Description of known water quality improvements or degredation;
8. A summary of watershed wide coordination with other permittees, the Fourth Year report will identify activities that will be implemented during the next permit term.

Improved Tracking on O and M Activities

The tracking of O and M activities will be will be enhanced during the permit term. The program should include three main areas:

a) Completing automation of the storm sewer system database;
b) A system for tracking and inspecting private facilities; and
c) Establishing methods for tracking maintenance activities.

Regulatory Program Monitoring

Regulatory program monitoring is intended to assure:

a) Stormwater facilities perform as designed before ownership transfers to the County;
b) Habitat preservation covenants are followed and effective;
c) Erosion control measures are effective;
d) Wetland covenants are being followed and that wetland mitigations are implemented as designed;
e) Source control BMPs are in place at certain commercial and industrial sites; and
f) Monitoring Plans for Chapter 13.36 Wetlands Protection.

Data Management, Coordination, and Reporting

Ongoing Activities

Data Management

Currently, data is collected and stored separately by each project. Excel, Access and Arcview are the principal data storage and analysis tools for Public Works, while Community Development uses a special software package for tracking permit activities and enforcement actions. The Department of Assessment and GIS stores county-wide resource and land use data.

Proposed Activities

Data Retention

The permit will have requirements for data retention and quality controls that the County will meet.

Centralized Stormwater Management Program Data

A centralized repository or indexing system of all data relevant to the stormwater management program should be created and managed. Systems should include water resource data, summaries of O and M work, inspections and enforcement actions.

Budget tracking systems should be set up to track the program.

Standard Procedures and Monitoring Plans

Ongoing and Proposed Activities

The Environmental Services Division assembles the monitoring plans and standard operating procedures for collection and handling environmental samples for NPDES monitoring, Drywell Management Program sampling and miscellaneous measurements.

PUBLIC INVOLVEMENT FOR WATERSHED MANAGEMENT AND EDUCATION

PROGRAM OVERVIEW

Public involvement for management and education are an important part of a resource protection program because regulation alone is unable to address the thousands of sources of nonpoint pollution. Clark County has several public involvement and education programs that are described in this section. The Public Works Environmental Services Division has water resource and waste management programs that include public outreach and education. Community Development has limited technical assistance for implementing development regulations.

The major need for the involvement and education program is to develop an overall focus and comprehensive approach. Another major need is increased outreach to educate businesses and individuals about the stormwater pollution control BMPs required by the permit or simply needed to reduce stormwater pollution.

Along with Public involvement for reducing pollutants, this chapter describes the public process to establish and implement advisory committees to advise the Board of County Commissioners on policy and technical issues regarding watershed management and stormwater management/NPDES implementation. Examples of issues to be addressed include: establishing a stormwater management funding mechanism, establishing stormwater management priorities, providing guidance and public involvement for regulatory changes, and interagency coordination.

CURRENT

NAME	CURRENT (1998) FTE	CURRENT (1998) COST	YEAR 1 FTE	YEAR 1 COST
Business Partners for Clean Water	0.1	$8,500	0.1	$8,500
Lacamas Lake Restoration Policy Advsiory Board	0.2	$16,400	0.2	$16,400
Build a Better Clark	0.2	$36,000	0.2	$36,000
Commercial Waste Reduction	0.4	$32,000	0.4	$32,000
Small Quantitiy Waste Generator Assistance Program	0.1	$10,000	0.1	$10,000
Motor Oil Recycling	0.1	$10,000	0.1	$10,000
Mobil Hazardouse Waste Collection	0.1	$10,000	0.1	$10,000
Moderate Waste Collection Disposal Fees	0.1	$300,000	0.1	$300,000
Lacamas Lake Restoration Outreach	0.6	$50,000	0.6	$50,000
East Fork Outreach	0.5	$40,000	0.5	$40,000
Lacamas Lake Ag BMPs	0.4	$70,000	0.4	$70,000
Wellhead Protection Grant Project	0.5	$67,800	0.5	$67,800
East Fork Ag BMPs	0.4	$30,000	0.4	$30,000
Environmental Information Center Support	0.25	$40,000	0.25	$47,500
Burnt Bridge Creek Public Involvement	0.05	$6,000	0.05	$6,000
TOTAL:	**4**	**$726,700**	**4**	**$734,200**

PROPOSED

NAME	CURRENT (1998) FTE	CURRENT (1998) COST	YEAR 1 FTE	YEAR 1 COST
Outreach for Completing Basin Plans	0	$0	0	$0
River Rangers Program	0	$0	0.5	$41,000
Wellhead Program Evaluation	0	$0	0.05	$4,000
Watershed Stewards Program	0	$0	1	$82,000
Stormwater Specific Outreach and Education	0	$0	0.5	$41,000
Establish Watershed Advisory Process	0	$0	1	$90,000
Develop Overall County Outreach and Education Program	0	$0	0.25	$21,000
Unmet Needs Assessment	0	$0	0	$0
Co-permittee Coordination	0	$0	0.05	$4,100
County Policy on Pesticide, Fertilizer and Herbicide Use	0	$0	0	$0
Lawn Care Campaign	0	$0	0.15	$10,000
TOTAL:	**0**	**$0**	**3.5**	**$293,100**
PROGRAM TOTAL:	**4**	**$726,700**	**7.5**	**$1,027,300**

SUMMARY OF REVENUE SOURCES BY YEAR
PUBLIC INVOLVEMENT AND EDUCATION

CURRENT

SOURCE	CURRENT (1998) REVENUE	YEAR 1 REVENUE	YEAR 2 REVENUE	YEAR 3 REVENUE	YEAR 4 REVENUE
GENERAL FUND	$90,675	$90,675	$34,100	$34,100	
GRANTS	$372,025	$372,025	$282,300	$282,300	$180,000
SOLID WASTE TIP FEES	$218,000	$218,000	$218,000	$218,000	$218,000
STORM SEWER SERVICE FEES	$6,000	$6,000	$6,000	$6,000	$6,000
UNKNOWN	$40,000	$47,500	$56,500	$56,500	$56,500
TOTAL:	**$726,700**	**$734,200**	**$596,900**	**$596,900**	**$460,500**

PROPOSED

SOURCE	CURRENT (1998) REVENUE	YEAR 1 REVENUE	YEAR 2 REVENUE	YEAR 3 REVENUE	YEAR 4 REVENUE
UNKNOWN	$0	$293,100	$364,200	$360,100	$360,100
TOTAL:	**$0**	**$293,100**	**$364,200**	**$360,100**	**$360,100**
PROGRAM TOTAL:	**$726,700**	**$1,027,300**	**$961,100**	**$957,000**	**$820,600**

CURRENT WATERSHED MANAGEMENT ACTIVITIES

Clark County watershed management programs are a collection of activities and programs that directly or indirectly support the goal of performing watershed management. The programs are currently administered by the Environmental Services Division. In the future, it is likely that a more comprehensive watershed management program will occur following the listing of salmon and trout as threatened or endangered under the Federal Endangered Species Act (ESA). These broader ESA programs will likely be administered by the Clark County Board of County Commissioners Office. Watershed management may also result from future non-point pollution Total Maximum Daily Load requirements by Ecology for several County streams.

Watershed management under initiatives to protect salmon and trout will be regional in nature and likely address activities beyond the scope of the NPDES permit.

The County is initiating a watershed council in the unincorporated of Burnt Bridge Creek basin. This project may provide a step toward establishing watershed councils in many of the basins in Clark County.

Lacamas Lake Restoration Program

The Lacamas Lake Restoration program was established in 1983 for the purpose of improving the water quality of Lacamas Lake. The primary task of the program is to provide technical and financial assistance to farms and livestock owners in Lacamas Creek basin to implement livestock and animal waste BMPs.

Planning Process

The Lacamas Lake Policy Committee serves as an advisory and planning group for program activities. Both County staff and the policy committee are involved in shaping the program. Adjustments in program activities are made based on monitoring program conclusions, completion of specific program tasks, and changes in the watershed.

The policy committee includes representatives from County government, the City of Camas, the Washington Department of Ecology, local conservation groups, the development industry, and the agriculture business.

Priority Setting Process

The 1985 Phase I Diagnostic Report concluded that priority should be given to implementing agricultural BMPs to improve waste management and protect riparian zones. Secondary priorities are design and marketing of BMPs and monitoring. Individual farms are prioritized for BMPs using a rating system developed during an intensive farm survey in 1987. In response to changing land use in the watershed and relatively complete participation by large commercial farms, the program is shifting its BMP focus to smaller, non-commercial hobby

farms. Watershed modeling is being conducted to help assess and evaluate the direction of the program based on changing watershed conditions.

Historical Watershed Planning Activities

The Watershed Planning program was a short-term planning process intended to establish self sustaining stormwater and watershed management programs in Clark County.

Watershed Planning goals were to:

- Develop capital improvement projects to control stormwater runoff volume and remove pollutants from runoff;
- Create a program to reduce sources of pollutants to waters in each basin;
- Enhance existing public education and outreach functions to show individuals better ways to protect water resources; and
- Secure a sufficient revenue source to fully implement watershed plans.

Burnt Bridge Creek Watershed Plan

The Burnt Bridge Creek Watershed Plan was adopted by the Clark County Board of County Commissioners in 1996. The purpose of the plan was to describe a set of programs including a CIP and O and M, and specify revenue sufficient to fund the activities.

Planning Process

The plan was reviewed by a technical committee and subject to a full public review as a part of approval by the Clark County Planning Commission and the Clark County Board of Commissioners.

Implementation

The plan is not being implemented because utility fees were not raised to fund actions called for by the plan. The plan currently acts as a guide for constructing limited capital improvements and recommended maintenance schedules. Areas annexed by the City of Vancouver in January 1997 are not subject to the plan because it was not adopted for the City.

Burnt Bridge Creek Council

The Burnt Bridge Creek Utility is attempting to establish an advisory council to help guide actions by the utility. At this point, a broad call for members was issued but only five applications have been received.

Unadopted Salmon Creek/Lakeshore Watershed Plan

The purpose of the plan was to describe a set of Stormwater management programs including a preliminary capital improvement plan and increased storm sewer maintenance, and monitoring, then specify revenue required to complete the proposed actions.

Planning Process

In Salmon Creek, there was a large planning effort (1988 to 1992) that included an extensive public involvement component. That effort, produced a detailed plan including a preliminary CIP and a list of goals and objectives for the basin, and field inventories of problems and habitat. The more recent (1996-1998) Lakeshore/Salmon Creek area planning was considered an update and implementation of the earlier plan.

A committee of representatives of business interests, environmental interests, government agencies and concerned citizens reviewed and commented on the recent Plan. The Plan was also subject to public review before and during hearings by the Clark County Planning Commission and the Clark County Board of Commissioners. As a requirement of the utility formation law, Chapter 36.94 RCW, the capital plan was reviewed and approved by a technical review committee.

Watershed Planning for Endangered Species Act Listings

Multi-jurisdiction planning for Water Resource Inventory Area 27 (Lewis River basin) and Water Resource Inventory Area 28 (Lake River and Washougal River basins) are expected to begin during 1999 under the State Lower Columbia Steelhead Conservation Initiative. The initial planning will be funded largely by State grants and is expected to address water resources, habitat issues, and possible regulatory revisions.

PROPOSED STORMWATER MANAGEMENT/NPDES ADVISORY COMMISSION

The County is beginning a process to establish advisory boards to address watershed management issues throughout Clark County and stormwater management/NPDES issues in unincorporated Clark County. The proposed process would establish a County-wide advisory group to deal with watershed management policy issues. The current plan is to establish another advisory group, chaired by a member of the watershed advisory group to address stormwater management/NPDES issues from both policy and technical sides. Tasks for the stormwater group are likely to include advising the Board of County Commissioners on possible storm sewer service fee options, development of new stormwater regulations, and advising on stormwater capital project selection. In this document the stormwater management/NPDES advisory board will be referred to as the Stormwater Management Advisory Committee (SMAC).

General Process for Establishing and Implementing the SMAC and Establishing a Funding Strategy.

October to December 31, 1998 - Establishing the SMAC

During this time, we anticipate the Board would hold several work sessions to define and establish the SMAC. Activities would include:

- Dedicating support staff to carry the process forward;
- Defining the mission, e.g. how far does the SMAC go (will the SMAC address only stormwater);
- Investigating the County's authority regarding a SMAC;
- Deciding the limit of SMAC authority, e.g. set rates or advise the BOCC;
- Determining the number of members and a method for member selection;
- Passing an ordinance forming the SMAC;
- Selection of SMAC members; and
- Establishing Work Tasks for 1999.

January 1999 to June 30, 1999 - Making a Recommendation for Stormwater Funding

During the first half of 1999 the SMAC will most likely be called on to evaluate methods for funding the NPDES Stormwater Management Program. The SMAC would conduct public meetings to discuss and deliberate on funding options. The following lists some probable actions:

- Provide background and education for SMAC members;
- Define possible funding options for raising a specific amount of yearly revenue;
- Work with County staff and the public to investigate possible funding options;
- Document the alternative options, research, and analysis;
- Select a preferred option and describe the selection process; and
- Forward the results to the BOCC.

July to September 31, 1999 - Adoption of a Funding Method

During this period the results of the SMAC are presented to the BOCC and the public for deliberation. The Board would make its decision regarding a funding source for the NPDES SWMP. During this time period, the Washington Department of Ecology will probably issue the Clark County NPDES permit.

October 1999 - Implementation

Clark County begins establishing the SWMP funding program so that revenue is available for new activities in the year 2000 and beyond.

CURRENT REGULATORY EDUCATION PROGRAMS

The habitat preservation code involves development of a site plan, mitigation actions, and a stewardship program for each site. Erosion control programs are being developed by Community Development and the County Homebuilders Association to help individual contractors comply with erosion control requirements.

CURRENT MODERATE RISK HAZARDOUS WASTE PROGRAM

The program implements the objective to reduce the disposal of moderate risk hazardous waste in landfills, public sewer systems, septic systems, and on all other lands.

Program components include Household Hazardous Waste Education, Household Waste Collection, and Small Quantity Generator Education. Activities include annually collecting over 400,000 pounds of household hazardous waste at two facilities; collecting over 80,000 gallons of used oil via curbside collection; providing nearly 100 on-site business consultations per year; providing special workshops attended by up to 350 businesses per year; sponsoring two or three small quantity generator collection events per year; publishing and distributing a directory containing information on household hazardous waste disposal and proper alternatives to household chemicals.

Moderate Risk Waste Disposal

Collection of household hazardous waste occurs at two permanent collection facilities. Waste is properly disposed of by the County. The project reduces the amount of wastes that could potentially be dumped in storm sewers, on the ground or into water bodies. The annual disposal costs for the household hazardous waste is about $300,000.

Mobile Moderate Risk Waste Collection and Education

This 1998 pilot program provides one day moderate risk waste collection events for residents and small businesses farther than 5 to 10 miles from a permanent household hazardous waste collection facility. The mobile program also provides an opportunity to educate users on proper household hazardous waste management and non-toxic alternatives.

Motor Oil Recycling

The project provides alternatives to waste oil disposal to the ground and storm sewers. Educational and promotional activities include Do-It-Yourself used motor oil recycling; promotion of re-refined motor oil; placement and maintenance of waste oil collection tanks, and curbside collection of used oil.

Small Quantity Generator Technical Assistance Program

This program is intended to increase small quantity generators' (SQGs) awareness and understanding of applicable ordinances, regulations, guidelines, and alternatives through distribution of information, waste audits and technical assistance visits, and workshops. The program assists SQGs with proper management and disposal of dangerous wastes by establishing collection events or increasing opportunities for SQGs to properly dispose of their wastes. Proper disposal reduces illegal and improper discharges of hazardous wastes to the county's waste collection system, sanitary sewers, storm sewers, the ground, groundwater and surface waters.

Commercial Waste Reduction, Recycling and Pollution Prevention

This program coordinates the Technical Assistance Program (TAP), the Business Recycling Awards Group (BRAG) and other Business assistance and recognition programs to provide opportunities for the dissemination of technical assistance and information, and for waste evaluation and survey through waste audits. Project goals include waste reduction, toxics reduction and pollution prevention.

Seasonal Events

Fall leaf collection is coordinated as a seasonal event to prevent leaves from clogging storm sewers and causing localized flooding. The public is notified regarding leaf collection and disposal options.

Build a Better Clark

Clark County Public Works and the Clark County Homebuilders Association have entered into a partnership to develop and implement a non-regulatory environmental building program. The program benefits cities and Clark County. The program will be self-certified and recognize all participating builders and remodelers who incorporate environmentally sound practices and products in their building projects. Examples of environmentally sound building practices include waste reduction and recycling, site and water quality protection, resource conservation, energy efficiency and homeowner education.

Business Partners for Clean Water

Business Partners for Clean Water is a non-regulatory, educational, business recognition program to help businesses learn ways to keep pollutants off the ground and out of the water. It is modeled after the successful City of Bellevue program. Businesses attend workshops and prepare water quality protection action plans.

Environmental Information Center

Clark County manages the inter-local agreement with the Environmental Information Center (EIC). The EIC is a program set up to educate citizens and educators in the county on environmental issues by distributing materials,

presentations at events, answering phone inquiries, publishing newsletters, conducting training workshops, maintaining an extensive library open to the public and coordinating a Environmental Speakers Bureau.

Proposed Natural Lawn Care Campaign

This program, proposed to start in 1999, is an education campaign to reduce residential use of chemical pesticides and fertilizers; promote waste reduction through grasscycling and home composting; conserve water and reduce runoff through xeriscaping and efficient watering practices; and conserve energy and protect air quality by reducing use of gas powered blowers and mowers.

CURRENT WELLHEAD PROTECTION PROGRAM

The Wellhead Protection Program is funded by a grant from the Washington Department of Ecology through December 1999. Program elements include general education using billboards, road signs, workshops, presentations and theater slides. It also supports the business partners for clean water program conducted in conjunction with the Solid Waste Program's Moderate Quantity Generator Program and BRAG program.

The Wellhead Grant will be evaluated near its completion to determine which activities were successful and should be continued.

CURRENT BURNT BRIDGE CREEK UTILITY ACTIVITIES

Public involvement includes input from the general public for budget hearings and hearings for individual projects. Public education includes placement of watershed signs on streams, mailings, workshops and presentations, poster handouts, billboards, and catch basin labeling. Creation of a Citizen Board is being considered to provide input to decide priorities for the Utility. Currently, there is little public interest in participating.

CURRENT LACAMAS LAKE RESTORATION PROGRAM ACTIVITIES

The Lacamas Program recognizes the importance of public involvement and education to the success of watershed management and lake restoration activities. Major activities include: semi-annual newsletters, presentations to area schools, storm drain stenciling by Scout groups and students, mud and manure management workshops, and the development of a series of educational signs. The program cosponsors the annual Lacamas Lake Festival to raise public awareness about watershed issues, and actively supports other public activities such as the annual Lacamas Lake shoreline clean-up day. Through these activities the program will continue to sponsor community stewardship and educate watershed residents about the importance of protecting water quality.

BMP Implementation, Design, and Marketing in Lacamas Lake Basin

Description of this activity is included as information about Clark County stormwater or resource protection programs. It is not a required part of the NPDES Stormwater Management Program.

The BMP Implementation task is based on voluntary participation by both commercial agricultural operations and non-commercial "hobby" farms. The program provides 75 percent of the cost of implementation and the landowner is responsible for the remaining 25 percent. The Natural Resource Conservation Service (NRCS) performs the design and inspection of program BMPs through a budgeted contractual agreement with the Lacamas program.

As of June 1997, the program had assisted approximately 43 landowners install 39 waste management and 66 riparian BMPs. Riparian BMPs include such projects as riparian fencing, livestock crossings, alternative livestock watering, and tree planting. Waste management BMPs include waste collection systems, waste storage and distribution systems, and clean water diversion.

The character of the watershed is changing rapidly as commercial farms are replaced by development and small hobby farms. Nearly all of the remaining commercial farms in the watershed have already participated in the Lacamas cost-share program. Program staff are currently reviewing and modifying the BMP implementation process in order to more efficiently meet the needs of smaller farms.

Four landowners are currently being assisted with the implementation of one riparian and seven waste management BMPs. The program anticipates working with approximately five landowners each year through the completion of the grant in the year 2001. Marketing of BMPs and solicitation of participants is an ongoing process pursued by Lacamas staff and the NRCS through newsletters and workshops.

CURRENT EAST FORK LEWIS RIVER IMPLEMENTATION PROGRAM

The overall goal of the East Fork Program is to improve and protect waters of the East Fork Lewis River watershed. This will be done primarily through voluntary, cooperative efforts with emphasis on public education and implementation of accepted best management practices for a range of pollution sources.

Parts of this program that are related to agriculture and forestry are included as information about Clark County stormwater or resource protection programs. They are not a required part of the NPDES Stormwater Management Program.

Planning Process

Following an extensive characterization and public involvement process, a program was established to implement a nonpoint source pollution reduction program in the East Fork basin. The program is funded largely by a State Centennial Clean Water Grant. The program builds on recommendations from the characterization studies

and East Fork Lewis River Advisory Committee. An action plan listed areas of activity and prioritized the geographic areas where specific program elements should be targeted.

Implementation

The project is chiefly an education and outreach program, focusing on common sources of nonpoint pollution in rural areas. These activities are described in the Public Outreach and Education section of this chapter.

Overall education includes activities that are common to all categories of nonpoint pollution addressed by the program. Examples include interpretive kiosks, public event news releases, brochures, and organizing volunteer riparian plantings.

Agriculture activities will focus on education about BMPs and their implementation. Forestry efforts will emphasize awareness of existing water protection programs and new approaches to timber management.

The program will attempt to reduce impacts from development by using education and incentives for innovative, environmentally friendly development approaches. Examples include an erosion control workshop for members of the development industry, highlighting successful projects in the media, and presentations to show homeowners how to minimize impacts from home sites.

Efforts to reduce impacts from recreational use will focus on education and redirection of recreational use traffic away from damaged or sensitive areas. It includes informational signs for parks, inventory of problem areas, volunteer plantings for areas of heavy damage, and work with Parks staff to minimize destructive uses.

OTHER CURRENT ENVIRONMENTAL SERVICES ACTIVITIES

Numerous activities centering on water resource protection education and outreach are performed for more than one program or project by Environmental Services. These include:

- A program promoting voluntary storm drain stenciling by providing paint, stencils, and safety equipment;
- Supporting the River Rangers program for 4th graders;
- Participating in several annual events such as the Lacamas Lake Watershed Festival; Salmon Creek Watershed Festival; Earth Action Day; the Clark County Home and Garden Fair; the Clark County Fair; Meet the County at Vancouver Mall, and Camas Days;
- Performing classroom and public presentations on water quality and assisting teachers on classroom field trips with plant and macroinvertebrate studies;
- Offering small farm pasture management and manure management classes;
- Placing signs identifying streams and watersheds at stream crossings;

- Producing a variety of handouts for distribution at presentations and special events; and
- Distributing two sets of theater slides on wellhead protection that are shown in local theaters during intermission breaks.

PROPOSED STORMWATER MANAGEMENT INVOLVEMENT AND EDUCATION ACTIVITIES

This section includes a group of activities intended to focus and enhance the County's involvement and education programs with regard to stormwater management.

Develop and Overall County Outreach Program to Address Stormwater

This task would establish goals or a mission for County public outreach and education related to pollutant reduction and beneficial use protection. The intent is likely to be to optimize coordination inside the County and with other organizations to create focused program to address stormwater issues.

Stormwater-Specific Outreach and Education

This program would add about two persons to perform outreach and education directed specifically at stormwater issues. The initial focus will be on implementing pollution control BMPs for businesses and residents. It will probably site visit oriented to provide support for businesses subject to new water quality requirements such as implementing source controls and performing storm sewer maintenance. Residential education may take the form of public service announcements and other media-oriented actions.

Watershed Stewards

One FTE is proposed to establish and implement a watershed stewards program modeled after successful programs from other areas.

River Rangers Program

River Rangers is an outreach and education program aimed at elementary school children. A standard training program is available.

Public Outreach for Completing Basin Planning

If additional basin capital plans are completed under the Capital Program Element, a concerted public outreach program would be performed.

Copermittee Coordination

Normally, there is a requirement for copermittees to coordinate their activities. Clark County is being issued an individual permit with no copermittees. Therefore,

this requirement does not apply. Clark County does communicate informally with Puget Sound municipal permittees to exchange information useful to the programs.

Unmet Needs Assessment

The draft Stormwater Management Program has a needs assessment that uses available information, previous public input, and staff recommendations. This task, to be undertaken prior to the fourth year of the permit term, will attempt to synthesize new information and current policies to prioritize activities for the next five-year permit term. The process will involve the public in the evaluation.

County Policy on Pesticides, Herbicides and Fertilizers

This task will establish an overall policy for the County to follow in it's use of pesticides, herbicides and fertilizers.

CAPITAL IMPROVEMENT PROGRAM

PROGRAM OVERVIEW

Capital improvements are performed by the Public Works Department for several County programs. The Burnt Bridge Creek Utility builds stormwater control facilities and other small projects as its budget permits. Transportation projects subject to the Clark County Stormwater Control Ordinance are required to include flood control and treatment facilities. Emergency and maintenance projects prevent or alleviate hazards to public safety or property. A County-wide capital plan is being developed for local drainage problems.

Pubic Works Department staff manage stormwater and transportation design projects, Burnt Bridge Creek projects, and other projects for the Operations Division. Some Public Works Department design work is done in house and some is contracted. Preliminary and final design for drainage projects are shared by Environmental Services and the Transportation Design Section.

Project Management for construction phases is by the Public Works Department.

Revenue Sources

Storm Sewer Service Fees

The Burnt Bridge Creek Utility receives revenue from a fee of $1.75 per month per residence (or per 2,500 square feet of impervious area for multi-family, commercial, and industrial sites) and interest on cash reserves. The utility funds projects on a pay as you go basis.

The Road Fund

The County road Fund is derived from real property tax assessments and gasoline taxes. Road fund money is used for construction of stormwater controls for runoff from County road projects. It is also used on a limited basis for storm sewer improvements associated with existing road runoff and to remove fish passage barriers from County right-of-way.

Grants

Grants from Federal Emergency Management Administration and the U.S. Army Corps of Engineers are used to for projects that address regional flooding problems. State grants are applied to fish passage barrier removal projects.

SUMMARY OF FTE ANI
CAPITAL IMPROVEM

CURRENT

NAME	CURRENT (1998) FTE	CURRENT (1998) COST	YEAR 1 FTE	YEAR 1 COS
BBC Utility Small Projects	0.6	$220,000	0.6	$220,0
Lakeshore/Salmon Cr. 1998 Drainage Improvement Project	1	$225,000	5.2	$1,646,(
BBC flow control and treatment facilities	0.8	$250,000	0.8	$250,0
Prelliminary Eng. Plans for BBC, SC, and LS	2.5	$205,000	0	$0
Fish Passage Barrier Removal	0.5	$234,000	0.5	$573,0
County-wide M and O Problem Area Identification Project	0.75	$61,500	0	$0
Conservation Futures Program		$5,000,000		$7,000,(
TOTAL:	**6.15**	**$6,195,500**	**7.1**	**$9,689,**

PROPOSED

NAME	CURRENT (1998) FTE	CURRENT (1998) COST	YEAR 1 FTE	YEAR 1 COS
Program to Involve Public in Stormwater Capital Project Selection	0	$0	0.25	$20,5(
Implement County-wide M and O Problem Area Identification Project	0	$0	0	$0
Preliminary Engineering Plans for Developing Basins	0	$0	0	$0
Existing Facilities Upgrades Investigation	0	$0	0	$0
Stormwater Controls for Existing Development	0	$0	0	$0
TOTAL:	**0**	**$0**	**0.25**	**$20,5(**
PROGRAM TOTAL:	**615**	**$6,195,500**	**7.35**	**$9,709,**

SUMMARY OF REVENUE SOURCES BY YEAR
CAPITAL IMPROVEMENT PROGRAM

CURRENT

SOURCE	*CURRENT* (1998) REVENUE	*YEAR 1* REVENUE	*YEAR 2* REVENUE	*YEAR 3* REVENUE	*YEAR 4* REVENUE
GRANTS	$27,000	$265,000	$50,000	$50,000	$50,000
ROAD FUND	$698,500	$1,954,000	$150,000	$150,000	$150,000
SPECIAL FUNDS	$1,000,000	$1,300,000	$0		
STORM SEWER SERVICE FEES	$470,000	$470,000	$220,000	$220,000	$220,000
UNKNOWN	$0	$0	$0	$0	$0
BONDING	$4,000,000	$5,700,000	$6,500,000		
TOTAL:	**$6,195,500**	**$9,689,000**	**$6,920,000**	**$420,000**	**$420,000**

PROPOSED

SOURCE	*CURRENT* (1998) REVENUE	*YEAR 1* REVENUE	*YEAR 2* REVENUE	*YEAR 3* REVENUE	*YEAR 4* REVENUE
UNKNOWN	$0	$20,500	$102,500	$1,112,500	$1,112,500
TOTAL:	**$0**	**$20,500**	**$102,500**	**$1,112,500**	**$1,112,500**
PROGRAM TOTAL:	**$6,195,500**	**$9,709,500**	**$7,022,500**	**$1,532,500**	**$1,532,500**

Other Revenue Sources

Clark Public Utilities is contributing money to help fund County projects to remove fish passage barriers.

CURRENT STORMWATER PROJECTS

Burnt Bridge Creek Utility

The County Burnt Bridge Utility includes about thirty percent of the area of Burnt Bridge Creek basin. The remaining seventy percent of the basin is within the City of Vancouver and is served by the City-wide utility. The Burnt Bridge Creek Utility area is expected to be completely annexed or incorporated into the city by the year 2003, eliminating the County-operated utility.

Almost all new drainage and stormwater treatment facilities are built on site by private developers of new construction under requirements of the County Stormwater Control Ordinance. The few improvements made by the Utility are prioritized to first address existing flooding problems, then projects that are called for by the 1995 Capital Improvement Program. The Utility plans to build three storm line projects in 1998. Two small regional facilities are planned to be completed prior to 2003. One is the Crystal Springs facility in Cold Creek basin. The other is the Thomas Lake facility in St Johns basin.

Unadopted Lakeshore/Salmon Creek Capital Improvement Plan

A preliminary capital plan was completed for the Salmon Creek basin and Lakeshore area. Many projects were listed to address existing water quality and excess flow problems. Few projects will be completed until there is a revenue source and a county-wide process to rank projects.

Lakeshore/Salmon Creek Drainage Improvement Project

Fifteen priority problems from the unadopted Lakeshore/Salmon Creek preliminary engineering plan are going to be solved by this project. Individual projects are listed in Appendix D. Most of the projects are small and address some sort of drainage or severe stream bank erosion problem. Most of the projects include some degree of mitigation for excess flows.

Description of this activity is included as information about Clark County stormwater or resource protection programs. It is not a required part of the NPDES Stormwater Management Program.

County-Wide Drainage Problem Area Identification Project

A program was initiated in late 1997 to inventory and estimate the cost to address over 400 drainage problems within the County. The project should provide

alternative solutions and cost estimates for each problem. No construction is planned currently.

Description of this activity is included as information about Clark County stormwater or resource protection programs. It is not a required part of the NPDES Stormwater Management Program.

Drywell Management Retrofit Planning

The Drywell Management grant will provide a preliminary design having alternative retrofit options for County drywells. The area of interest will be upper Burnt Bridge Creek basin and Curtin Creek basin. The project is for planning and BMP selection.

CURRENT NON-STORMWATER PROJECTS THAT ENHANCE BENEFICIAL USES

Description of the following habitat enhancement projects is included as information about Clark County stormwater or resource protection programs. They are not a required part of the NPDES Stormwater Management Program.

Conservation Futures Program

While not a construction program, the County-wide Conservation Futures Program, operated by Vancouver/Clark Parks and Recreation, specifically protects beneficial uses by purchase of land to prevent development along streams and rivers and in flood plains. The program is funded by a 6.25 mil rate on real property tax levied on all properties in Clark County. Additional information is needed describing the projects, purpose for each project and the revenue sources.

Tax Incentives for Open Space and Timber Land Protection

The County gives land owners Current Use tax incentives to set aside areas for Open Space protection of natural resources, streams, soil, recreational enhancement, and historic sites. In 1996, there were 7,186 acres in this program. Timber Land Current Use lands include properties greater than 5 acres that are used primarily for the growth and harvest of forest products. In 1996, there were 12,011 acres in the Timber Land program. The current use program is revenue neutral because the tax benefit to open space parcels is compensated for in the County budget by increased taxes on all other parcels.

Fish Passage Barriers

The County has an ongoing program to remove fish passage barriers in a County right-of-way. A study was completed to guide selection of future projects. The study identified fish barriers and then prioritized them based on significance to fisheries.

PROPOSED ACTIONS

Process to Prioritize Projects

Clark County lacks a public process to evaluate and propose specific projects. As a part of implementing a capital program, the County intends to establish a committee to advise the county on selection of specific projects. The committee and process will be similar to the Transportation Improvement Program Involvement Team program. Watershed characterization performed by the monitoring program and county stormwater management priorities will guide project selection. At this time the County is proposing to establish a Stormwater Management Advisory Commission that may complete this task. The Public Involvement and Education Section describes this proposed action.

Preliminary Capital Plans for Developing Basins

Several urbanizing basins lack capital plans, notably Whipple Creek basin, upper Gee Creek, and lower Lacamas basin. The program may include evaluation of existing facilities, projects to mitigate for existing development, and stream channel rehabilitation. Also, planning may be a tool for addressing the permit requirement for retrofitting entire redevelopment sites. The program will utilize information generated by proposed watershed characterization (Monitoring and Evaluation section)

Prioritization of Projects for State Department of Transportation Utility Fees

By statute, the Washington Department of Transportation allocates some money, in lieu of utility fees, to local drainage utilities. The fee allocation, as it is referred to, is based on a competitive process. By using the funding criteria as a review for projects and areas, the county may be able to fund some currently unfunded project.

Discussion with Public Works staff identified two areas: An uncompleted project on Suds Creek near Interstate Highway 5 and Cougar Creek near Interstate Highway 5 is a priority area for treatment of urban drainage water.

Stormwater Controls for Existing Development

This is a yet undefined program to build one or more stormwater control facilities or stream channel rehabilitation projects to improve beneficial uses degraded by existing development. Projects may include mitigations for redevelopment that cannot feasibly control runoff on site.

Existing Facilities Upgrade Investigation

A limited number of County facilities may be may be possible to reconfigure to increase performance or make performance better integrated into basin. Work will consist of a preliminary screening of the facilities design and their relation to the basin hydrology.

Implement the County-Wide M and O Problem Area Project (not a NPDES requirement)

Begin performing projects to address the problems identified in the County-wide M and O Problem Area Identification Project. Currently, there is no budget for this project.

CHAPTER 4

PERMIT REQUIREMENTS

September 30, 1998 Draft

CONTENTS

PERMIT REQUIREMENTS

INTRODUCTION

This chapter, summarizes the current and proposed activities that meet specific NPDES permit requirements. Most of the actions are described in greater detail in Chapter 3. The permit requirements are listed in numerical order, followed by a brief summary which refers to the relevant program elements in Chapter 3 or provides other information where Chapter 3 does specifically address requirement.

Each of the "permit requirements" is printed along with further clarifications and detailed expectations from Ecology. **The permit requirements and all additional clarifications from Ecology are in *italic type***. Each permit requirement and added clarifications are followed by a brief description of Clark County's proposed actions to meet the permit requirement**. Clark County's actions are in regular font.**

Special Note: These permit requirements are from the Puget Sound Permit. Some changes may be made by the Washington Department of Ecology for the Clark County permit. Possible changes are not completely defined at the time the draft Stormwater Management Program was submitted with the NPDES Part 2 application.

Permit Requirements

The NPDES Stormwater Management Program Report (SWMP) is being submitted to obtain permit coverage under a yet unwritten NPDES permit. Due to this, permit requirements have not been written for Clark County at the time that the stormwater management program is written. The permit requirements listed here are taken from the NPDES permit issued in July 1995 for regulated municipal storm sewer operators in the Puget Sound area. The Puget Sound area permit was used for several reasons. The Puget Sound area municipalities spent several years negotiating with the State to arrive at the permit conditions, a process that would be time consuming and expensive for Clark County to pursue. The permit conditions reflect the requirements of the Clean Water Act with some minor modifications for Pacific Northwest conditions and requirements of a Washington waste discharge permit. The completed stormwater programs for Puget Sound provide a template for Clark County to develop its permit application, while considering our local stormwater management activities.

Along with the permit requirements, Ecology and the Puget Sound permittees published a document called Clarification of Permit Requirements (March 1995). The Clarification of Permit Requirements was the outcome of negotiations between the permittees and Ecology. It expands upon the generally worded permit requirements to provide a more specific description of the expectations of permittees to meet the permit requirements. Finally, there are additional possible changes

from Department of Ecology correspondence (O'Brien, February, 1996; Wessel, October, 1996; and Wessel, July 1998) to the County.

S7.B. STORMWATER MANAGEMENT PROGRAM REQUIREMENTS

Summary

The stormwater management program is the core requirement of the permit. It describes the County actions that implement the permit requirements. Eight components make up the plan, they are:

1. Description of the Planning process used to develop the program;
2. An analysis of stormwater needs;
3. Demonstration of adequate legal authority;
4. A program to monitor program effectiveness;
5. A fiscal analysis and a description of the funding source;
6. A description of the system to gather and maintain necessary information;
7. Identification of area-wide coordination mechanisms; and
8. A description of controls to reduce pollutants in stormwater.

S7.B.1. COMPREHENSIVE PLANNING PROCESS

Permit Requirement

A description of a comprehensive planning process used to develop the stormwater management program including public participation, intergovernmental coordination, and the relationship to other planning processes.

Expectation from Clarification of Permit Conditions

The proposed program will describe the planning process used to develop the program that involved responsible public officials and department managers accountable for any aspect of the program development and implementation.

Possible Changes from the Clarification of Permit Conditions from O'Brien, February 1996.

The SWMP should receive stand-alone public review and elected official approval.

Summary

The County Administrator assigned the former Water Resources and Development Engineering Division of the Department of Community Development to oversee SWMP development. On January 1, 1998, the NPDES program and other stormwater management and water resource programs were transferred to the Department of Public Works Environmental Services Division. The Public Works Department is responsible for implementing much of the stormwater management program.

The NPDES program requested various county managers to provide descriptions of their program activities, budgets and revenue sources.

Concurrent with SWMP development, the county conducted a stormwater management planning program. Programs that are part of the NPDES SWMP are the listed in the following section. Unadopted basin plans for Salmon Creek basin and the Lakeshore area may be a primary tool for implementing stormwater management. An existing County utility maintains drainage ways in the unincorporated parts of Burnt Bridge Creek basin.

The NPDES Stormwater Management Program

The SWMP for the 1999 through 2003 permit cycle was developed by the Environmental Services Division under direction of the Clark County Board of Commissioners. The Stormwater Management Program Report was written during 1997 and 1998.

Planning actions such as the unadopted Lakeshore/Salmon Creek Watershed Plan and Burnt Bridge Creek Watershed Plan underwent public review separate from the NPDES SWMP.

The proposed actions of the SWMP were developed through discussions among County staff including project managers, division managers and department heads during June through August 1998.

Public NPDES work group meetings allowed interested parties to review the proposed actions and provide guidance to staff for completing the report. There were seven work session meetings during July and August 1998.

A SEPA DNS was published in August 1998.

Periodic meetings were held with the Board of County Commissioners during 1998. Prior to submittal of the Part 2 application, the Clark County Board of Commissioners are expected to approve the SWMP. A method to fund proposed new activities will be developed during 1999. Board approval includes at least one public hearing.

Watershed Planning

A watershed plan was adopted for Burnt Bridge Creek Basin in 1996. A preliminary plan was completed but not adopted for the Lakeshore/Salmon Creek area. The process for creating and approving these plans is described in the Public Involvement and Education section in Chapter 3.

A key element of the SWMP will be creation of a watershed advisory group to address issues such a recommended funding mechanism and establishing clear policies for implementing stormwater management in the County.

The Regulatory Program Development

Clark County code additions and amendments are subject to a lengthy public review process. Water resource protection code and development regulations are put in place to control development and meet other requirements such as the Growth Management Act.

New code sections are usually drafted under a process that uses a focus group to frame the issues for the first draft by staff. The draft code is then subjected to review and redrafting by the focus group and a public review process including public meetings, public hearings before the Clark County Planning Commission, and hearings leading to approval of the final ordinance by the Clark County Board of Commissioners.

Development of the County Operations and Maintenance Program

The O and M program is developed by Public Works to most effectively manage the drainage infrastructure and road surfaces using available resources. Activities are prioritized based on a plan and in response to public requests for service.

Development of the County Solid and Hazardous Waste Program

The waste reduction program at Public Works Department Environmental Services Division developed out of a state-mandated process to manage solid waste and hazardous waste material.

Development of the Public Involvement and Education Program

Several programs are involved in public outreach and education. These are primarily grant funded projects and waste reduction programs performed by the Environmental Services Division.

Development of the Monitoring Program

Lacamas Lake monitoring is subject to oversight by the Lacamas Lake Restoration Policy Committee. Other monitoring programs were developed to meet specific needs of stormwater planning or grant projects. In those cases the interested parties agreed on the approach to be used.

S7.B.2. MANAGEMENT NEEDS AND PRIORITIES

Permit Requirement

An analysis of stormwater management needs, a system for prioritizing needs, a description of the basis for the priority system, and an implementation plan and schedule for the term of the permit that reflect the priority needs. The stormwater management program must have an appropriate balance between prevention and correction based upon available information about sources of pollution and discharges from municipal separate storm sewers owned or operated by the permittee.

Expectation from Clarification of Permit Conditions

The SWMP will include an explanation of how program needs have been determined and prioritized and how resource allocation decisions have been made. This explanation will comprise data and supporting analyses that address the following topics.

Information Basis

Presentation and evaluation of information used to identify needs and establish priorities, including:

- *current and projected population densities;*
- *land use and zoning decisions;*
- *watershed hydrology;*
- *water quality data; and*
- *and other information relevant to evaluating program effectiveness and the impacts of stormwater on receiving waters and beneficial uses within the permittee's jurisdiction.*

Problem Identification

Identification of present and predicted water quality problems (surface water, groundwater and sediment) attributable to stormwater runoff, including an analysis of stormwater impacts on beneficial uses and ecosystems. Watershed plans and similar efforts to identify water quality problems through a combination of scientific analysis and public involvement may be used as a basis of problem identification. SWMPs are expected to focus on problems strongly linked to stormwater runoff.

Solutions

A list of solutions to the problems identified. Current budgets should not constrain the identification of effective solutions; however, it is expected that permittees will focus on solutions that are feasible and cost effective.

Existing Programs

A description of what the permittee is now doing to solve identified problems.

Program Needs

Identification of program needs by comparing solutions to existing programs. Possible program enhancements should be identified for all significant problems not addressed by current activities; however, prioritization will mean that only some program enhancements are funded in any given permit period.

Prioritization

A description of and justification for the permittee's priorities for continuing existing programs and implementing new programs or program enhancements. There should be a clear link between the prioritization of problems/solutions and the allocation of resources to stormwater management programs.

Stormwater Management Program

A description of level of effort, implementation schedule, and proposed budget for each program component over the term of the initial permit, beginning in 1998.

Needs and Prioritization Detailed Guidance

The following criteria are listed as guiding the selection of needs and prioritization of solutions:

- *Balance of preventative and corrective programs*
- *Priority on source controls*
- *Cost-effectiveness as a criterion for prioritization*
- *Consideration of community values*
- *SWMPs are expected to evolve throughout the permit period.*

Possible Changes in the Clarification of Permit Conditions form O'Brien, February 1996

We expect an overall prioritization system.

Unlike the statement in the stormwater management program section of the Needs and prioritization that permittees will not be expected to increase expenditures to address unmet needs within the first 3 years of the permit, Ecology states that they expect Clark County to begin increased expenditures to meet unmet needs in FY 1998.

Summary

Chapter 2 describes the process for prioritizing stormwater management problems and activities. It includes a list of the background information; identifies stormwater management problems; sets management priorities for the problems; and describes Clark County program element priorities for stormwater management. Appendix A includes tables with a preliminary list of the problems sources, solutions, existing programs and unmet needs. Appendix B includes a preliminary problem analysis by basin or planning area.

The County identified major areas of proposed action based on the analysis described in Chapter 2. They are largely efforts to establish the foundation of a stormwater management program and include activities such as completing storm sewer mapping, identifying a dedicated revenue source for stormwater, bringing the regulatory program into compliance with permit conditions, initiating a centralized data management and water resource monitoring program, initiating a capital

program to address existing beneficial use loss, and beginning a county-wide watershed planning program.

Stormwater Management Priorities – Summary and Conclusions

Identifying the many problems associated with stormwater has shown how interdependent stormwater runoff management and protecting aquatic resources are. Clark County's stormwater management program is in an initial phase as a unified process under NPDES permit requirements. A systematic approach to stormwater management is a new activity at the County. Development of overall County priorities to address all of the stormwater problems was not completed at this early stage in the program. Several priorities did guide selection of the actions listed in Chapter 3. Priorities are described here and are not in any particular order.

Stormwater Management Program is going to evolve and change during the permit term. Part of the program will be to set out clear priorities for the next permit term and for implementing new actions during the permit term.

Identify Revenue Sources for Stormwater Management

Current actions are performed to meet ongoing obligations to provide a level of service, protect the public, protect the environment, or follow regulatory requirements. Most of the current actions are part of a baseline stormwater management program that meet Clean Water Act requirements or the County's obligations to manage storm water runoff. Some current actions are one-time projects using a specific and limited source of funds. Since there is no place to cut current programs to fund new stormwater management actions, a new source of revenue is needed to fund increased stormwater management.

Protect Public Safety and Property

Protecting public safety and property from damage due to stormwater runoff and flooding is a stormwater management goal. The Regulatory Program Element, Operations Program Element and Capital Improvement Program Element all contain current and several proposed actions to protect the public from stormwater runoff and flooding.

Take Immediate Actions to Prevent Further Water Resource Degradation

We know that immediate or short-term actions can be taken to reduce the damage done to aquatic habitat by land development and current activities. Capital projects to mitigate for existing stormwater problems are very costly and difficult to quickly implement. Short-term actions include regulating stormwater controls for land development, increasing storm sewer maintenance, increasing education and increasing inspection and enforcement.

Improve the Information for Making Stormwater Management Decisions

The outcome of stormwater management decisions can influence activities throughout the county. Expenditures for stormwater management are expected to increase due to the need to protect fish habitat and eventually meet state water quality standards. Sound stormwater management decisions require good information about current conditions and the ability to reasonably predict the outcome of stormwater management options. Improving and expanding the monitoring and evaluation program is necessary to do this.

Involve the Public in Stormwater Management Decision Making

In order to make policy choices that are acceptable to the community, public involvement and outreach processes are used to develop ordinances and shape new programs such as a capital improvement program, and funding options.

Educate the Public to Protect Water Resources

Non-point pollution prevention and habitat protection can not be performed without an educated public. The Stormwater Management Program includes increased education to meet this priority.

Chapter 3 describes the current and proposed actions for each major program element. It also includes budget projections and description of revenue sources.

S7.B.3. LEGAL AUTHORITY

Permit Requirement

Adequate legal authority to control discharges to and from municipal separate storm sewers owned or operated by the permittee. This legal authority, which may be a combination of statute, ordinance, permit, contract, order, or inter-jurisdictional agreements with other permittees which have existing legal authority, shall include the ability to:

i) Control the contribution of pollutants to municipal separate storm sewers owned and operated by the permittee from stormwater discharges associated with industrial activity, and control the quality of stormwater discharged from sites of industrial activity;
ii) Prohibit illicit discharges to the municipal separate storm sewer owned or operated by the permittee;
iii) Control the discharge of spills and the dumping or disposal of materials other than stormwater into the municipal separate storm sewers owned or operated by the permittee;
iv) Control through interagency agreements or inter-jurisdictional agreements among permittees, the contribution of pollutants from one municipal separate storm sewer to another;
v) Require compliance with the conditions in ordinances, permits contracts or orders; and

vi) Within the limitations of state law, carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance with local ordinances.

Expectation from Clarification of Permit Conditions

The permittee has adequate legal authority. The authority should provide the ability to:

- *control industrial discharges*
- *prohibit illicit discharges*
- *control spills and dumping*
- *control discharges from one jurisdiction to another*
- *require compliance through appropriate legal tools*
- *carry out inspection and enforcement to insure compliance*

Permittees may emphasize technical assistance, business outreach programs, and public education as long as legal authority is in place.

Possible Changes in the Clarification of Permit Conditions from O'Brien, February 1996

We expect the permittee to have adequate legal authority in place when the permit is issued.

Summary

The present County Code addressing legal authority to control pollutant discharges and the authority of the County to enter into agreements with other permittees are described in detail in the Part 1 application. Code is briefly discussed in the Regulatory Program section in Chapter 3. Overall, Clark County has sufficient legal authority to meet this requirement or is in the process of modifying code during the permit term.

The County is in the process of adopting an ordinance giving the County legal authority to control pollutant discharges and spills to County owned or operated storm sewers. The code is expected to be adopted in fall 1998 and will likely also regulate certain pollutant discharges to waters of the state.

S7.B.4. MONITORING PROGRAM

Permit Requirement

A program to monitor the effectiveness of the stormwater management program in reducing pollutants discharged and reducing impacts to surface waters, groundwater, and sediments. The monitoring program, based upon the priorities identified in Special Condition S7.B.2., shall address field evaluation, sampling, and analysis to:

a) Estimate concentrations and loads from representative areas or basins to be used in evaluating overall program effectiveness;

b) Evaluate the effectiveness of selected Best Management Practices;

c) Identify specific sources of pollution; and
d) Identify the degree to which stormwater discharges are impacting selected receiving waters and sediments. The monitoring program shall include a quality assurance/control plan.

Expectation from Clarification of Permit Conditions

Monitoring objectives will be based on the prioritized needs and proposed solutions.

Permittees will focus monitoring efforts toward evaluating BMPs, identifying problems, correcting identified problems, and evaluating the effectiveness of the SWMP.

Permittees will not be expected to institute new groundwater or sediment monitoring during the first permit cycle unless such monitoring is identified as a high prioirity in the SWMP.

Monitoring Programs for the first term do not need to include all objectives listed in S7.B.4.

Each permittee will be expected to do some independent monitoring to evaluate overall program effectiveness; shared data may be used for BMP evaluation, land use characterization, and other appropriate analyses useful for guiding resource allocation decisions.

Summary

The monitoring program is described in Chapter 3. It examines program priorities and problems, evaluating the current monitoring program, and proposing data collection and analysis that will support the development the SWMP and evaluation of the SWMP success. During the first term of the permit, the monitoring program administration will be aimed at centralized data reporting and storage, and improved record keeping. Data gathering will focus on inventory and problem identification. Another focus will be to set up tracking systems to evaluate the efficacy of regulatory programs. Issues of regional data collection for ESA and program objectives will determine the extent and form of monitoring.

Specific activities are:
- Continue stream gauges
- Continue rain gauges
- Continue Lacamas basin water quality projects
- Continue stormwater BMP test
- Add proposed crest gauge monitoring
- Add proposed outfall screening project
- Add proposed stream gauge project for hydrologic analysis
- Add proposed rain gauge project for hydrologic analysis
- Add selected watershed characterization projects as planning and funds allow

Investigations to characterize basins for stormwater or watershed management activities will be performed in concert with activities under the Endangered Species Act.

Monitoring plans are submitted for current projects as a separate document. The When the County develops new monitoring projects to meet the requirements of the permit, the monitoring plans will be submitted to the Washington Department of Ecology for review and approval.

S7.B.5. FISCAL ANALYSIS

Permit Requirement

A fiscal analysis, covering the term of the permit, of the capital, and operation and maintenance expenditures necessary to implement the stormwater management program, and a description of staff, equipment, and support capabilities to implement the stormwater management program. The fiscal analysis shall include a description of the source of funds that are available or are proposed to meet the necessary expenditures.

Expectation from Clarification of Permit Conditions

The fiscal analysis will describe the anticipated source of funding for the SWMP, and a strategy for securing funding where shortfalls exist. The analysis will explain any limitations on spending funds identified.

The fiscal analysis will estimate staff, equipment and funding needed for each program component required by section S7B of the municipal permit.

The SWMP budget will propose annual funding levels during the term of the permit for each program component required by section S7B of the municpal permit.

The fiscal analysis will identify anticipated cost-sharing arrangements among permittees intended to reduce permittee costs of permit compliance.

Permittees are not expected to submit a detailed inventory of all equipment necessary to implement the SWMP.

Summary

Each program element description in Chapter 3 includes a description of the annual budget for each current and proposed activity. The each program element includes an overall summary of the proposed revenue and revenue sources. Budget and revenue estimates are imprecise and are based on current understanding of program development. Funding sources can vary depending on the establishment of a new dedicated revenue source, the amount of road funds allocated to storm sewer maintenance, use of development fees for new NPDES mandated regulation development and implementation, annexations of urban tax base, availability or the

life-span of grants, and changes in overall County priorities that might influence funds available to stormwater programs.

Proposed Stormwater Management/NPDES Advisory Commission as an advisory group for Funding Options

At the time of its Part 2 application, Clark County has not defined revenue sources for almost all proposed new activities. Ecology agreed that this issue may take several months to address and agreed to accept a reasonable strategy to obtain funding and a schedule. The following section is a description of the proposed strategy and schedule to establish a funding source for unfunded proposed activities.

The County is beginning a process to establish advisory boards to address watershed management issues throughout Clark County and stormwater management/NPDES issues in unincorporated Clark County. The proposed process would establish a County-wide advisory group to deal with watershed management policy issues. The current plan is to establish another advisory group, chaired by a member of the watershed advisory group to address stormwater management/NPDES issues from both policy and technical sides. Tasks for the stormwater group are likely to include advising the Board of County Commissioners on possible storm sewer service fee options, development of new stormwater regulations, and advising on stormwater capital project selection. In this document the stormwater management/NPDES advisory board will be referred to as the Stormwater Management Advisory Committee (SMAC).

General Process for Establishing and Implementing the SMAC and Establishing a Funding Strategy.

October to December 31, 1998 - Establishing the SMAC

During this time, we anticipate the Board would hold several work sessions to define and establish the SMAC. Activities would include:

- Dedicating support staff to carry the process forward;
- Defining the mission, e.g. how far does the SMAC go (will the SMAC address only stormwater);
- Investigating the County's authority regarding a SMAC;
- Deciding the limit of SMAC authority, e.g. set rates or advise the BOCC;
- Determining the number of members and a method for member selection;
- Passing an ordinance forming the SMAC;
- Selection of SMAC members; and
- Establishing Work Tasks for 1999.

January 1999 to June 30, 1999 - Making a Recommendation for Stormwater Funding

During the first half of 1999 the SMAC will most likely be called on to evaluate methods for funding the NPDES Stormwater Management Program. The SMAC

would conduct public meetings to discuss and deliberate on funding options. The following lists some probable actions:

- Provide background and education for SMAC members;
- Define possible funding options for raising a specific amount of yearly revenue;
- Work with County staff and the public to investigate possible funding options;
- Document the alternative options, research, and analysis;
- Select a preferred option and describe the selection process; and
- Forward the results to the BOCC.

Budget and Expense Tracking

The ability to track revenue and expenditures by program components is feasible using Element and Work Order codes in the County accounting system or a system of billings to a special revenue fund.

S7.B.6. DATA MAINTENANCE

Permit Requirement

A mechanism for gathering, maintaining and using adequate information to conduct planning, priority setting, and program evaluation activities. The information and its form of retention shall include but not be limited to:

a) Mapping of known municipal separate storm sewer outfalls;
b) Mapping of tributary conveyances, and the associated drainage areas of major municipal separate storm sewer outfalls;
c) Maps depicting land use;
d) Maps depicting zoning; and
e) A data base, including at least the following information: precipitation records; stormwater quality and quantity records; water quality and physical characteristics of receiving water that may be impacted by stormwater; and a description and location of major structural BMPs and other structural controls for stormwater discharges.

Expectation from Clarification of Permit Conditions

The SWMP will describe the existing system for gathering, maintaining, and using information needed for planning, priority setting, and program evaluation; identify any needed improvements in the system; and an implementation schedule.

Summary

Data are collected and maintained by several county departments and agencies in the County.

Storm Drainage Mapping

In 1994, the County began field checking paper drainage maps and entering storm drainage structures into the County GIS. In general, current mapping includes constructed drainage structures such as pipes, manholes and catch basins that are owned and operated by the County. Most of the existing mapping is within urbanized areas. A major activity of the monitoring program is to complete an entire system map including complete flow paths for each drainage system. Storm sewer mapping is described in Chapter 3 under Monitoring and Evaluation program and the Regulatory program.

GIS Data

Clark County presently maintains a GIS database that includes land use descriptions, zoning classifications, basin boundaries, water bodies, county-owned or operated stormwater conveyances and drywells, basin boundaries, many of the County owned or operated stormwater control facilities, and other information useful for stormwater planning. Improvements are planned for describing stormwater conveyances during the term of the permit.

County GIS maps include the following actively maintained layers:

- Parcel boundaries and attributes including land use and zoning
- Administrative boundaries
- Easements from quarter sections
- Subdivision boundaries
- Roads

GIS data from various sources that are maintained as needed or may not be maintained:

- Stormwater lines (pipes and some ditches)
- Stormwater points (manholes, catch basins, drywells, etc.)
- Stormwater control facilities
- NPDES sample points
- Sanitary sewer lines
- Drainage basins
- Sub basins in watershed planning areas
- USGS topographic contours
- Localized 2 foot contours
- GMA land use
- Zoning
- City Boundaries

- Conservation easements
- Orthophotographic images
- Urban Growth Boundary for GMA
- State and federally owned lands
- City/County Parks
- Percent slope
- Aquifer units
- Water wells
- Comprehensive land use plan for GMA
- Flood Plains
- Gravel pits
- Wellhead protection areas
- Septic systems
- Solid waste facilities
- DNR water features

Water Quality and Quantity Data

Chapter 3, Monitoring section describes the County environmental data collection and storage procedures. Electronic data from the stream and rainfall recorders is presently stored by the collecting agency and often linked to Arcveiew maps. Stormwater quality and quantity data, drywell sediment quality data, and chemical and physical data for ambient conditions in the County's receiving waters, are contained in several databases.

During the term of the permit, Clark County will create and maintain a centralized data management system for environmental monitoring data collected by the County and other sources.

S7.B.7. WATERSHED-WIDE COORDINATION

Permit Requirement

Identification of watershed-wide coordination mechanisms and a schedule to complete the following during the term of the permit:

a) Development of coordinated stormwater management programs for shared water bodies among permittees;

b) Coordination of data management and mapping activities for compatibility among permittees; and

c) Coordination of monitoring and modeling activities to develop comparable data sets among permittees when estimating pollutant concentrations and loads, evaluating impacts, and addressing controls.

Possible Permit Changes from O'Brien, February 1996

(from page 8) This requirement applies to coordination between Clark County and WDOT only, since there are no other permittees in the basin. However, the condition

can also have some limited applicability to any co-permittees such as port districts and drainage districts that are identified.

Expectation from Clarification of Permit Conditions

1. *SWMPs include a description of mechanisms to address stormwater problems that span political boundaries.*

2. *Data management and mapping will be coordinated among permittees to the extent feasible.*

3. *Monitoring and modeling activities are coordinated among permittees to the extent feasible.*

4. *A watershed planning and management process may be used by jurisdictions for identifying management goals and the roles and responsibilities of the participants. The scale of watershed, e.g. regional, river basin, sub-basin will be identified by the jurisdictions involved.*

5. *Municipalities are expected to identify and prioritize activities which WDOT can undertake to assist in implementing municipal SWMPs. WSDOT is expected to consider these priorities in developing its permit and statewide priorities.*

Expectation from O'Brien, February 6, 1996

(from page 9) Expectations 1 through 4 may not apply. However, 2 and 3 could be coordinated with existing permittees. Expectation 5 does apply.

Summary

Ecology has notified the County that this permit application will result in the issuance of an individual permit for Clark County. There will be no copermittees until the County is covered under the proposed state-wide permit in 2000.

S7.B.8. STORMWATER CONTROL COMPONENTS

Summary

The permit requires the County to take actions to reduce pollutants in the stormwater discharged to receiving waters. There are nine stormwater control components, each is described separately.

S7.B.8.a. NEW DEVELOPMENT, REDEVELOPMENT AND CONSTRUCTION SITE RUNOFF

Permit Requirement

A program to control runoff from new development, redevelopment and construction sites that discharge to the municipal separate storm sewers owned or operated by the permittee. The program must include: ordinances, minimum requirements and best management practices (BMPs) equivalent to those found in Volumes I-IV of Ecology's Stormwater Management Manual for the Puget Sound Basin (1992 edition and as amended by its replacement), permits, inspections, and enforcement capability. The program must also include a process to make available copies of the "Notice of Intent for Construction Activity" and/or copies of the "Notice of Intent for Industrial Activity" to representatives of proposed new development and redevelopment.

Added Requirements from Wessel, July 1998

In lieu of minimum requirement #5 of Ecology's Manual the program must include a requirement that will prevent increases in the duration and peaks of stream flows that cause stream channel degradation. The ordinance(s) and manual must be adopted within 18 months of permit issuance.

The program to address water hydrology and pollutant loads must include a schedule to assess and evaluate potential impacts from projected development, and actions to adequately mitigate impacts to watershed hydrology and beneficial uses, and minimize increases in pollutant loads to the maximum extent possible.

Added Expectations for 8.a. from Wessel, July 1998

Permittees are expected to provide a process and a schedule for using a continuous simulation model for establishing stormwater flow control requirements to prevent increases in duration and peaks of storm flows that cause stream channel degradation. If it will take more than 18 months to put a continuous simulation model in use, permittees are expected to take interim measures to improve on the flow control standard in the 1992 Stormwater Management Manual for the Puget Sound Basin. Possible options for interim measures include: make assumptions and use an unverified continuous model; or use a longer duration (7-day) storm event with an single event model.

Permittees are expected to conduct watershed or basin planning to assess and evaluate the impacts from new development. It is expected that this planning will be integrated into existing planning efforts and will address surface water, ground water and sediment quality. Permittees may address factors such as flooding that are outside the purview of the municipal stormwater permit.

Possible Permit Changes from O'Brien February 1996 and Wessel October 1996

The state can not require equivalence with the Puget Sound Manual because Clark County was not notified that it would be expected to adopt a technically equivalent manual. It may be considered reasonable guidance. If a statewide manual exists it may be cited. It may also reference the Puget Sound Manual with a flexibility statement assuring accepted engineering practices for example. Clark County will, however, be expected to have a substantially equivalent set of standards.

Expectation from Clarification of Permit Conditions

SWMPs include a description of existing programs to control runoff from new development and redevelopment. Or, as necessary, SWMPs include a proposed plan and schedule for a program of permitting, inspecting, and enforcing which provides competent, timely regulation of all new development and redevelopment.

Permittees are expected to consider land use regulation as a means of minimizing stormwater impacts.

Municipalities adopt an ordinance, minimum requirements and BMPs equivalent to those in Ecology's Stormwater Management Manual. Ecology's equivalency guidance dated March 1994 will be used to determine equivalence.

SWMPs must include a process to make available copies of the "Notice of Intent for Construction Activity" and/or copies of the NOI to representatives of proposed new development or redevelopment.

Permittees will continue to enforce local ordinances controlling runoff from construction sites that also require coverage under the Baseline General Permit for Discharges Associated with Industrial Stormwater.

To achieve success in protecting beneficial uses, permittees may be able to rely on Ecology to exercise its enforcement powers in severe situations to address nonpoint pollution. This must occur in concert with municipal enforcement.

Summary

Clark County currently uses the following development regulations to control adverse affects to stormwater quality or protect riparian habitat.

- Stormwater Control Ordinance
- Erosion Control Ordinance
- Wetlands Ordinance
- Grading Permits
- Wildlife Habitat Preservation Ordinance
- Geologic Hazards Regulations
- Critical Aquifer Recharge Areas Regulations

- Shorelines Master Program
- Draft Water Quality ordinance

The stormwater, erosion control, and wetlands Chapters are described in, and attached to the NPDES Part 1 application. The sensitive areas code chapters adopted after the Part 1 application are included in the description of the regulatory controls for development is included in the Regulatory section in Chapter 3.

The current stormwater and erosion control chapters require use of BMPs from the Puget Sound Manual and include standards that are largely equivalent to the Minimum Requirements of the Puget Sound Manual. Stormwater management equivalency to the Puget Sound Manual was described by comparing the Clark County code to the minimum requirements for stormwater management in the Puget Sound Manual (Swanson, February 1998) which is summarized in Chapter 3 and attached as Appendix C. That section also includes the proposed changes to County regulations to meet the requirement.

The program to address stormflow duration and peaks is also described in Chapter 3.

The county places Notice of Intent forms on display for proponents of new or redevelopment. Also, Development Services requires projects have all governmental permits as a part of a complete Technical Information Report for a Final Stormwater Plan. Chapter 13.25.410, Subsection (12) states:

> "Construction of roads and stormwater facilities may require additional water-related permits from other agencies. These additional permits may contain requirements which impact design of the stormwater system. This section shall list the titles of all other required permits, the agencies requiring the permits, and identify the permit requirements, if known, that affect the final stormwater plan. Approved permits that are critical to the feasibility of the stormwater facility design shall be included in this section."

Recent guidance from the State includes a requirement to perform planning to assess and evaluate impacts from projected development and take actions to adequately mitigate for development impacts to the maximum extent possible. Chapter 3 includes watershed planning elements in the Public Involvement section and the Capital Improvement Program section. These may be able to address this re requirement.

S7.B.8.b. CONTROL OF RUNOFF FROM EXISTING RESIDENTIAL AND COMMERCIAL DEVELOPMENT (INCLUDES RETROFITTING)

Permit Requirement

Appropriate treatment and source control measures to reduce pollutants in runoff from existing commercial and residential areas that discharge to municipal separate storm sewers owned or operated by the permittee.

Added Requirements from Wessel, July 1998

The program must include a schedule to assess and evaluate impacts from existing development, and to implement actions to reduce disturbance to watershed hydrology and pollutant loads to the maximum extent practicable.

The program must include capital improvements to begin restoring beneficial uses and solving existing water quality problems. Other aspects of this component may be addressed through compliance with Components 8.c. through 8.i.

Expectation from Clarification of Permit Conditions

SWMPs include a description of existing programs to control runoff from existing commercial and residential areas.

SWMPs include a plan and schedule for implementing structural and non-structural treatment and source control measures (including retrofitting) for the highest priority developed areas. This includes implementation of BMPs by the public agencies and private entities.

Summary

As refined by recent guidance from Wessel (July 1998), this requirement is directed largely at performing structural improvements to restore beneficial uses degraded by stormwater runoff from existing development. All of the capital program activities are described in Chapter 3 section for Capital Improvements. Initiating a program to address existing problems is dependent on establishing a revenue source and a means of identifying and prioritizing projects.

Non capital programs to improve stormwater quality include public outreach and O and M which are described separately in the remaining permit requirements.

Current Capital Program

The Burnt Bridge Creek has a limited capital program that will build two small detention facilities during the permit term.

Proposed Actions

In order to implement a County-wide capital program, several steps need to be made:

1. Establish a watershed advisory council to provide the BOCC guidance for implementing a County-wide stormwater management program revenue source and priorities for stormwater and watershed management.

2. Complete initial watershed characterization to target areas where program should focus activities.

3. Establish a committee to review proposed capital projects and advise the County regarding projects that best meet County priorities.

4. Perform capital planning for developing basins, including public involvement.

Actions are described in the Capital Improvement section and the Pubic Involvement and Education sections of Chapter 3.

S7.B.8.c. OPERATION AND MAINTENANCE OF MUNICIPAL STORM SEWERS

Permit Requirement

Operation and maintenance programs for new and existing stormwater facilities owned or operated by the permittee, and an ordinance requiring and establishing responsibility for operation and maintenance of other stormwater facilities that discharge into municipal separate storm sewers owned or operated by the permittee. The programs shall include a strategy for addressing the disposal of street waste, decant, and cooperative efforts with Ecology and other entities to develop decant solutions.

Expectation from Clarification of Permit Conditions

1. *SWMPs include a description of existing O & M programs that will be continued. O & M programs will establish policies for the desired methods and frequencies for inspecting and maintaining stormwater facilities, including catch basins, conveyances, and treatment BMPs. SWMPs will include a plan and schedule implementing those policies if initial capabilities fall short.*

2. *Permittees will adopt ordinances requiring maintenance of stormwater facilities not owned by the permittee, or the permittee will propose a schedule for adoption and implementation of an ordinance.*

3. *Upon completion of Ecology guidance for street waste disposal, permittees develop a strategy and schedule for a program for adequate disposal of street wastes.*

Additional requirement from O'Brien, February 1996

Possible additional expectation. Establishment of a data base to schedule and track maintenance. The data base will be used to schedule compliance inspections of private systems.

Summary

The current O and M program along with the current management standards, proposed standards, and means to meet the new standards during the permit term are described in Chapter 3. High priority new activities are establishing a comprehensive maintenance tracking system, completing the public and private storm sewer mapping, adding private facilities maintenance inspection, and changing the program for complaint response to an inspect and maintain program. Meeting higher standards will require additional funding for O and M.

A program to address private systems not currently subject to the maintenance requirements of Chapter 13.25 is required. Proposed actions are described under the Regulatory section and Operations and Maintenance section of Chapter 3. Regulatory action includes proposed adoption of an ordinance requiring that private storm sewers are maintained by their owners.

S7.B.8.d. OPERATION AND MAINTENANCE OF ROADS AND HIGHWAYS

Permit Requirement

Practices for operating and maintaining public streets, roads and highways, including rest areas, to reduce stormwater runoff impact.

Expectation from Clarification of Permit Conditions

SWMPs will include a description of existing road operation and maintenance program that will be continued. Programs will establish policies for desired cleaning methods and schedules, litter control strategies, road surface maintenance, and de-icing procedures. SWMPs will include a plan and schedule implementing those policies if initial capabilities fall short.

Summary

Chapter 3 includes a description of the operation and maintenance practices for roads and streets. This includes a description of the current road operation and maintenance program. The minimum standards for cleaning methods and schedules, litter control strategies, road surface maintenance, and de-icing procedures are described. The high priority changes are to increase street sweeping frequency and add preventative ditch and culvert maintenance. If funding is available increase roadside ditch mowing will be performed.

All road projects and operations are subject to Clark County code requirements including the Stormwater Control Ordinance, Erosion Control Ordinance, Water Quality Ordinance, Wetland Protection Ordinance and Habitat Preservation Ordinance.

S7.B.8e. CONSIDERATION OF WATER QUALITY IN FLOOD CONTROL PROJECTS

Permit Requirement

A program to include water quality management considerations into flood control management projects, including a schedule for retrofitting existing projects to the extent possible.

Expectation from Clarification of Permit Conditions

Water quality objectives are to be considered in design and implementation of flood management capital projects. SWMPs are to address how this will be accomplished.

Municipalities expect to identify existing flood management projects that are amenable to cost effective water quality retrofit and then develop, based on municipal priorities, a schedule to retrofit these projects.

Summary

Structural flood control measures include special projects to build detention ponds, and conveyances. There is a proposed action in the Capital Improvement Program section of Chapter 3 that will evaluate existing stormwater facilities for retrofit upgrades. As a standard engineering procedure, stream-bank erosion control and water quality treatment are included in almost every stormwater control facility. Conveyance retrofits may not always be totally mitigated.

S7.B.8.f. REDUCTION OF WATER POLLUTION FROM PESTICIDES, HERBICIDES AND FERTILIZERS

Permit Requirement

A program to reduce pollutants associated with the application of pesticides, herbicides, and fertilizer discharging into municipal separate storm sewers owned or operated by the permittee.

Expectation from Clarification of Permit Conditions

1. *SWMPs include a plan and a schedule for adoption and implementation of interdepartmental policies or specifications for use of herbicides, pesticides, and fertilizers aimed at minimizing water quality impacts.*

2. *Permittees will evaluate existing educational measures and implement additional educational measures for the general public and commercial applicators where necessary.*

Summary

There is no interdepartmental policy aimed at minimizing water quality impacts from pesticides, herbicides, and fertilizers. The County will adopt and implement such a policy during the permit term.

The Environmental Services waste reduction program focuses on reducing highly toxic wastes especially pesticides and paint. The Public Involvement and Education section of Chapter 3 includes a proposed activity to add a stormwater component to the education program and to evaluate the overall education program in view of other agencies activities.

S7.B.8.g. ILLICIT DISCHARGE, IMPROPER DISPOSAL, AND SPILL ABATEMENT

Permit Requirement

A ongoing program to detect, remove and prevent illicit discharges and improper disposal, including spills, into the municipal separate storm sewers owned or operated by the permittee.

i. *Each permittee shall effectively prohibit illicit discharges to the municipal separate storm sewers owned or operated by the permittee other than those authorized under a separate NPDES permit. Unless identified by either the permittee or Ecology as significant sources of pollution to water of the state, the illicit discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) need not be prohibited from entering the municipal separate storm sewers owned or operated by the permittee. As necessary, the permittee shall incorporate control measures in the stormwater management program to ensure these discharges are not significant sources of pollutants to waters of the state.*

ii. *The program shall include ongoing field screening, using the methods required in 40 CFR 122.26(d)(1)(iv), or alternative methods that have been approved by Ecology. The field screening program shall focus on urbanized areas.*

iii. *The program shall incorporate best management practices and procedures to prevent, contain, and respond to spills or improper disposal into the municipal separate storm drains owned or operated by the permittee.*

Expectation from Clarification of Permit Conditions

1. *Permittees will conduct an ongoing program, including inspection activities, to identify and prevent or remove illicit connections during the term of the permit.*

2. *Permittees will develop procedures to coordinate with spill response agencies.*

3. *Permittees will adopt and implement guidelines and procedures equivalent to those in Volume IV of Ecology's stormwater manual for the storage and containment of materials.*

4. *Permittees may integrate field screening activities with existing programs, for example, pretreatment inspections.*

Summary

Illicit Discharge Abatement

County sewer code, Chapter 13.10 prohibits the discharge of sewage or polluted water other than to a permitted treatment system. The code also allows the County Engineer access to inspect sewage systems. The Water Quality Ordinance, Chapter 13.26 Clark County Code, specifically addresses pollutant discharges to storm sewers, surface water, and groundwater. The ordinance requires procedures equivalent to the materials storage and containment requirements of Volume IV of the Stormwater Management Manual for the Puget Sound Basin (Washington Department of Ecology, February 1992).

Current and proposed activities are described in several sections of Chapter 3.

Regulatory actions include:
- Establishing a system to implement the Water Quality Ordinance
- Adding two Code Enforcement staff who are trained to respond to water quality complaints

O and M actions include:
- Proposed private storm sewer system maintenance inspection program
- Establishing an inventory and tracking system for private systems.

.
Proposed pollutant screening is described in the Monitoring and Evaluation section and includes:
- Proposed outfall screening
- Storm sewer mapping.

Spill response is coordinated through the Department of Emergency Services, 911 Agency. Emergency Services Policy memos describe the procedure for response to a reported hazardous material spill. Public Works will develop a more comprehensive spill control program during the first year of the permit term.

The County is required to follow the requirements of its Water Quality Ordinance which includes source controls for existing activities.

S7.B.8.h. INDUSTRIAL STORMWATER POLLUTION REDUCTION

Permit Requirement

A program to reduce pollutants in stormwater discharges from industrial facilities that discharge into municipal separate storm sewers owned or operated by the permittee, and ensure compliance with local ordinances. The program shall include, but not be limited to:

i. Procedures to identify industrial facilities that discharge into the municipal separate storm sewers owned or operated by the permittee.

ii. A field inspection program to assess compliance with local ordinances adopted in accordance with Special Condition S7.B.3; and

iii. A program to monitor and control pollutants in stormwater discharges to municipal separate storm sewers owned and operated by the permittee, from industrial facilities that the permittee determines are contributing a substantial pollutant loading to municipal separate storm sewers. For industrial facilities which require coverage under Ecology's "Baseline General Permit for Stormwater Discharges Associated with Industrial Activity," this program shall be developed jointly with Ecology.

Expectation from Clarification of Permit Conditions

1. *SWMPs will include an element intended to minimize impacts from industrial facilities; programs should include an inventory of industries, or a process to develop and maintain an inventory of industries, that discharge into the municipal systems. SWMPs will include a process to update the inventory and provide industries with instruction in compliance with the local stormwater management requirements. Permittees will notify Ecology when they are aware of industries that may require permit coverage by Ecology.*

2. *Some permittees do not anticipate monitoring discharges from industry to be a priority in the first permit cycle.*

3. *SWMPs will describe existing mechanisms to ensure industry compliance with local stormwater management ordinances. If no mechanisms currently exist, the SWMP will propose a process and schedule to develop them.*

4. *Municipalities will refer stormwater pollution problems associated with industrial (non-construction) NPDES permittees to Ecology unless the permittee has local ordinances that impose stricter stormwater management standards than imposed through the permit issued by Ecology. Negotiation between municipal permittees and Ecology on responsibilities in dealing with an industry regulated by both the municipality and Ecology is expected to occur during the first cycle.*

5. *Unless otherwise agreed to by the permittee, a permittee will not be expected to enforce an industrial NPDES permit issued by Ecology.*

6. *Permittees will not be held liable by Ecology for water quality standard violations caused by industries covered under an NPDES permit issued by Ecology unless the permittee has stricter stormwater pollution control requirements than those imposed by Ecology and the permittee's requirements have not been enforced.*

7. *Ecology intends to include as a permit condition in Industrial Stormwater Baseline General Permits and other industrial stormwater permits, the requirement that industries discharging to a municipal storm sewer system covered under an NPDES/state discharge permit comply with any applicable municipal codes and policies that impose stricter requirements for control of stormwater pollution than are imposed by the permit issued to the industry by Ecology.*

Possible Changes in the Clarification of Permit Conditions from O'Brien, February 1996

Expectation 4. If roles and responsibilities in dealing with regulated industries have been negotiated, then whatever is agreed to should be incorporated in the program.

Summary

The amount of industrial area in unincorporated Clark County is small and comprises scattered individual operations or small industrial areas. County actions are limited to those described for private storm sewer inventory, inspection and maintenance requirements described for Component 8.c. and Component 8.g.

Inventory

Many industrial facilities have been identified and contacted by County programs that promote waste reduction, Burnt Bridge Creek Utility operations, and the Business Partners for Clean Water Program. In addition, the Assessor's office records the land use on each parcel of land in its ARC/INFO data base. Department of Revenue records will also aid in identifying specific types of activities. A complete inventory is not established. This will be completed during the first permit term as a part of the private storm sewer inventory.

Regulatory Compliance

Pollution problems for facilities covered by NPDES industrial stormwater permits will be referred to the Department of Ecology. Other industrial sites will be subject to the local pollution control code will be adopted by late 1998.

S7.B.8.i. PUBLIC EDUCATION

Permit Requirement

An education program aimed at residents, businesses, industries and employees of the permittee whose job functions may impact stormwater quality. An education program may be developed locally or regionally. The program shall include: Education on the proper use and disposal of pesticides, herbicides, and fertilizers; training of construction contractors and developers on developing stormwater site plans and BMPs for construction activities; efforts to explain the definition and impacts, and promote proper management and disposal of used oil and toxic materials.

Expectation from Clarification of Permit Conditions

SWMPs will include ongoing efforts to educate residents, business, industries and employees of the permittee.

The program requirement may be fulfilled in part, by regional coordination.

Summary

Current and proposed education and outreach programs are described in the Public Involvement and Education section of Chapter 3. Currently, the Environmental Services Division conducts the solid waste program that includes a program aimed at proper management and disposal of hazardous waste and reducing hazardous or toxic materials use. Several of these programs focus on protecting water resources. The County also supports and participates in regional programs such as the Environmental Information Center and special events.

The proposed program includes increased educational outreach for adults and school children. An evaluation of current education programs and a component specific to stormwater quality protection.

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APPENDIX A. PROBLEMS, SOURCES, CURRENT AND PROPOSED SOLUTIONS

The tables in this Appendix were created in 1997 as a preliminary assessment of the stormwater management problems, their sources, solutions for each source, and current programs to provide the solutions. Unmet needs are also listed.

These tables were used as a method to list problems and possible solutions, and were not a process to select particular new activities.

There are many solutions and unmet needs listed to address water quality. Many solutions, such as septic system abatement are not part of a stormwater management program. Activities that directly address stormwater problems are included in the stormwater management program description in Chapter 3 and Chapter 4.

The Need by major program element, such regulatory program, described in Chapter 2, are the primary guidance for selecting the proposed actions to address stormwater management concerns and satisfy permit requirements.

APPENDIX B. PROBLEMS AND MANAGMENT PRIORITIES BY BASIN

PRIORITIES

Priorities are set to provide a set of criteria for making choices about how funding and staff will be allocated to meet the stormwater management needs. They are considered in determining if a problem is a management priority. Priorities are for the first five-year term of the NPDES permit. Water resource management and stormwater management priorities are set by County programs such as the watershed plans for Salmon Creek/Lakshore area and the Operations and Maintenance Division program. They are largely reported here.

NPDES Stormwater Management Program Goal

The stormwater management program goal is to establish a framework for meeting the goals of the Clean Water Act, namely to provide for the propagation of fish and wildlife, and provide for recreational uses. In additional to the Clean Water Act, Clark County also intends to protect groundwater supplies from pollutant discharges to the subsurface by storm sewers.

Detailed Guidance From the Department of Ecology

The Department of Ecology provided detailed guidance to Puget Sound permittees. This guidance also applies to the development of the Clark County stormwater management program. The guidance is listed below *in italics:*

Needs and Prioritization Detailed Guidance

The following criteria are listed as guiding the selection of needs and prioritization of solutions:

- *Balance of preventative and corrective programs*
- *Priority on source controls*
- *Cost-effectiveness as a criterion for prioritization*
- *Consideration of community values*
- *SWMPs are expected to evolve throughout the permit period.*

PRIORITY SETTING METHOD

Priorities are drawn from individual programs such as the unadopted Salmon Creek/Lakeshore watershed planning program and the Burnt Bridge Creek Utility. In areas where no specific program goals are in place, general county-wide goals are proposed.

Unadopted Salmon Creek and Lakeshore Plan

In December 1997 Clark County released a draft plan to better manage water resources in Salmon Creek basin and the Lakeshore planning area. The unadopted plan was intended to expand on the drainage capital improvement program to include specific goals and tasks for improving fish production and recreational use of Salmon Creek. The proposed plan was reviewed by a committee appointed by the Clark County Board of Commissioners and public testimony was accepted. The unadopted business plan does not have a scheme for prioritizing program activities, but lists this as an activity to be undertaken as a part of implementation.

The unadopted Business Plan (December 1997) includes a *Purpose Statement* and a list of *Goals.*

The Purpose Statement is:

> … to achieve fishable and swimmable conditions and reduce flooding in Lakeshore and Salmon Creek Watershed areas.

The unadopted Lakeshore-Salmon Creek Business Plan goals are:

1. Enhance water quality to meet or exceed Class A standards under WAC 173-201;
2. Improve fish and wildlife habitat to reach potential production estimates of native fisheries identified in the Legacy Plan (Clark County Conservation District, August 1990) habitat values identified in the Draft Wild Salmonid Policy (Washington Department of Fish and Wildlife, September 1997);
3. Reduce the risk to public safety, property, and natural resources resulting from flooding, including actions to correct existing infrastructure deficiencies;
4. Enhance water quantity; and
5. Enhance public awareness and facilitate natural resource stewardship.

Burnt Bridge Creek Utility Priorities

Burnt Bridge Creek Utility priorities are restricted by the low rate of the utility $1.75 per month per 2500 square feet of impervious area. The priorities are to:

- Provide adequate stormwater drainage to prevent flooding and
- Perform drainage system maintenance.

General Priorities for All Areas

Stormwater management program activities in all areas should be prioritized to meet two long term goals:

- Preserve and enhance beneficial uses of surface water and groundwater and
- Protect public safety and property from flooding.

PRIORITIZATION OF NEEDS BY BASIN AND PLANNING AREA

Needs are prioritized for each basin or planning area. Planning areas are sub-areas of basins that have similar geography and drainage, or groups of small basins draining to a common water body. The basin area approach is used because many water resource programs are implemented for individual basins. For instance, drainage utilities are being set up for separate basins. Currently, there is a utility in Burnt Bridge Creek basin. The Lacamas Lake Restoration Program and East Fork Implementation Program apply only to those specific basins.

Examining priorities and problems at a basin level also makes sense if each basin has a slightly different set of management concerns.

The process for establishing priorities is to rank the severity and management concern of the generic problems from the previous section for each basin or planning area.

Within each basin or planning area, problems are assigned a High, Moderate or Low rating to describe the severity of the problem. The ratings are subjective, but are based on available information such as 303(d) listing, 305(b) descriptions, local data, and local knowledge. In many cases the rating is a tentative one, based on limited information.

Each problem is then assigned a management concern rating. The management concern rating reflects the degree to which the problem is of immediate concern for watershed management. The management concern rating reflects several criteria including whether the problem needs to be addressed under stormwater management program priorities.

As an example, in a forested basin, contaminated runoff from industrial sites would be neither a current problem or a management concern; however sediment might not be a current problem but is a primary management concern. In urban areas, high management concern would be devoted to programs that solve existing problems and meet stormwater management priorities.

Another way of looking at the management concern rating is to consider it a measure of the need for immediate action to mitigate or prevent further degradation by the problem. Generally, a high rating implies that the problem needs to be addressed soon to stop loss of, or to rehabilitate the beneficial uses of a water body. A high rating can also be applied to protecting an exceptional resource such as a Class AA stream. Moderate suggests that the problem may not benefit from immediate action but should be considered as a part of the program if funds are available. A low suggests that immediate action is not required or that there may be no feasible solution.

High management concern rating criteria include:

- Immediate action is required to prevent loss or degradation of a beneficial use due to the problem;
- Immediate action is required to solve address public safety and property loss;
- Action is required to protect an exceptional water body such as a Class AA river;
- Action will be likely to have an influence during the next five years; or
- Action is required to meet the stormwater management program priorities.

Moderate management concern rating criteria include:

- A beneficial use loss may be lessened by the action;
- A current beneficial use may be threatened in the next five years;
- Action may be required within the next five years to solve or address the problem;
- Action may have an influence during the next five years; or

Low management concern rating criteria include:

- A beneficial use is not threatened by the problem;
- The problem is not necessary to address as a stormwater management program priority; or
- Action is unlikely to influence the problem within five years.

PROBLEMS AND RATINGS BY BASIN AND PLANNING AREA

Each basin or planning area is reviewed here to prioritize stormwater management program actions. The following section presents information for each basin or planning area.

A summary table of the estimated problem severity and a summary table of the of the preliminary management concern are presented here.

Insert 11x17 Color Figure Here

Insert Tabloid problem summary table Here

Insert Management Concern Table Here

LAKE RIVER AND TRIBUTARY BASINS

Lake River flows parallel to the Columbia River on the Columbia River flood plain from Vancouver Lake to its mouth on the Columbia near Ridgefield. The main tributaries are, from south to north: Burnt Bridge Creek (by way of Vancouver Lake), Salmon Creek, Whipple Creek, and Flume Creek. There are also numerous small tributaries draining directly from low hills next to the Columbia River flood plain. Lake River basin is in Water Resource Inventory Area 28.

Lake River and Vancouver Lake Lowlands

Lake River and Vancouver Lake Lowlands are within the Columbia River flood plain. The Vancouver Lake Lowlands area is approximately 22 square miles in area. It is directly influenced by the tidal cycles of the Columbia River. The Lowlands contain Vancouver Lake, Buckmire Slough, and various wetlands. Land use in unincorporated areas are largely limited to agriculture and open space due to flooding, wetlands, and large park and wildlife refuge areas.

Vancouver Lake covers an area of nearly 2,600 acres and receives flow from Burnt Bridge Creek and several small tributaries. A flushing channel between Vancouver Lake and the Columbia River was constructed to improve water flow through the lake as a means to enhance water quality. Because of the poor water quality of its tributaries, Vancouver Lake is eutrophic and is of a generally poor water quality. Efforts to improve the water quality of the lake must first improve the water quality of its tributaries.

Burnt Bridge Creek Basin Utility Area

Almost all of Burnt Bridge Creek and about 70 percent of the Burnt Bridge Creek basin are inside the City of Vancouver, outside of the Clark County NPDES permit area. The County-operated Burnt Bridge Creek Utility maintains drainage ways, regional stormwater facilities, and on-site residential stormwater facilities owned by the County. All County-owned and operated storm sewers are in unincorporated areas.

A watershed plan for Burnt Bridge Creek Basin was adopted by the County in 1996. However, no revenue source was specified to implement the plan. Consequently, the program has not been implemented in any part of the basin. The County utility operates primarily to assure that the drainage system prevents flooding and charges a rate of $1.75 per month per household, or per 2,500 square feet of impervious area for land uses other than single family residential.

Burnt Bridge Creek Utility Priorities

The Burnt Bridge Creek Utility allocates available resources toward minor capital projects and the maintenance of ditches, regional stormwater facilities and numerous small facilities in residential subdivisions that are donated to the County.

West Burnt Bridge Creek Basin Area

West Burnt Bridge Creek Basin includes the part of the utility that extends east from the mouth of Burnt Bridge Creek to Interstate-205. It is largely urban fringe residential development and strip commercial development with some small industrial areas.

Drainage systems are generally combinations of drainage ditches, roadside ditches, and pipes. Almost no natural channels occur in the utility area. The unditched channels include the lower Burnt Bridge Creek main channel and lower Cold Creek which are within the City of Vancouver. Undeveloped wetland areas tend to be grass and pastures.

Stormwater quality problems observed by field reconnaissance include untreated urban runoff, poor quality base flow draining from commercial and industrial areas, and stagnant water in ditches. Limited ambient sampling at the Cold Creek outfall to Burnt Bridge Creek during 1995 and 1996 showed that fecal coliform were generally between 100 and 500 organisms/100ml, and that temperature and dissolved oxygen (day time) met standards for a Class A stream. Groundwater contamination is present in Cold Creek basin at a chromium and solvent contaminated Superfund site. There are also relatively high nitrate concentrations in shallow groundwater.

The area has numerous small closed depressions that sometimes flood or have drywells that fail. The Cold Creek Canyon (inside Vancouver) has severe bank and canyon slope erosion problems and an inadequate pipe under Highway 99 and Interstate-5. Pipe capacity, flooding due to high groundwater, and failing drywells are cited as a serious problem in the Burnt Bridge Creek CIP. West of Interstate-5, the slope at the north edge of the Burnt Bridge Creek flood plain is susceptible to landslides. This area may have problems related to routing runoff down steep-gradient canyons.

East Burnt Bridge Creek Basin

East of Interstate-205, the unincorporated part of the basin is relatively flat and has, for the most part, well drained soils. No natural surface water features other than wetlands exist in the unincorporated area. This area is largely residential, with some strip commercial and isolated industrial development. Farmed or pastured wetlands and peat bogs are extensive along the north side of Burnt Bridge Creek.

Most of the storm runoff in this area is routed to infiltration devices such as dry wells, drainage trenches or perforated drain pipe. Some runoff is routed by pipes

and ditches into Burnt Bridge Creek or the adjacent lowlands. Generally, runoff routed to County-owned storm sewers is from streets, residential driveways, and residential roof drains. Commercial and industrial development usually drain to onsite drywells or drainage trenches, except in some cases where shallow groundwater makes it impossible.

Much of the area was built prior to the imposition of regulations requiring construction of water quality treatment, stormwater flow controls, and source controls. Water quality problems include concerns about untreated stormwater infiltration, untreated stormwater, and the riparian habitat problems for any part of the channel in unicorporated Clark County. A lack of adequate vertical separation between infiltration structures and groundwater are also identified as a significant drainage and groundwater quality concern (Clark County Water Quality Division, November 1995).

Drainage management problems are caused by extremely flat land, flat pipe gradients, undersized pipes, lack of overflow routes, and by groundwater flooding drywells.

Lakeshore Area

The Lakeshore area comprises a series of small basins in which creeks drain from flat uplands through steep canyons into Vancouver Lake or Lake River. The basins are between Burnt Bridge Creek basin and Salmon Creek basin. Most of the area is low density residential or grass fields. Forest is common in steep, undeveloped hillsides and valleys.

The storm sewer system is largely pipes draining to the steep canyons. Runoff control and water quality treatment are lacking for most areas.

There are few descriptions of historical and current stormwater quality problems in the Lakeshore area. Investigations by the Southwest Washington Health District in the late 1970s and early 1980s (unpublished data, Southwest Washington Health District) found that water draining from storm sewers was heavily contaminated by fecal coliform and noted that residential sewage was entering the storm sewers in this area. A comparison of old problem areas to current sanitary sewer line maps showed that some of the problems areas still lack sewer. The discharge of sediment and fecal coliform to Lake River is a concern. Also, if fecal coliform is still at levels of the 1970's and 1980's studies, health concerns exist for children who play in or along creeks.

Poor storm runoff controls cause eroded canyons, channels, localized ponding during heavy storms, and groundwater flooding. Localized flooding problems often are caused by building in closed topographic depressions or across natural drainage ways. Excess flows erode the canyons causing degraded riparian habitat, accelerated channel erosion, and probable sediment accumulation in Lake River. Landslides are a concern on steep slopes in the area due to the fine grained underlying sediments and shallow water table.

Salmon Creek Basin

The Salmon Creek basin is described here as three separate areas: lower Salmon Creek basin, middle Salmon Creek basin and upper Salmon Creek. The following section describes conditions and problems in each area.

Salmon Creek basin extends from Lakeshore east into the Cascade Mountains foothills. The principal urban areas are the City of Battle Ground and unincorporated built up areas inside the Vancouver urban growth area. Rural residential, small farm agriculture, and forest are the predominant land uses outside the urban areas. The total basin area is about 88 square miles.

Numerous reports describe conditions in the Salmon Creek basin. A nonpoint source TMDL report by the Washington Department of Ecology (October 1995) provides a succinct summary of water quality problems in the basin. Drainage-related problems are described by the draft Lakeshore and Salmon Creek Watershed Areas Business Plan (Clark County Public Works Department, December 1997) and in the Public Works "400 Problems Project". Streamside habitat was inventoried in 1988 and 1989 (Harvester and Wille, unpublished field notes) and a summary report was written describing the habitat and recommended actions to enhance fisheries (Clark County Conservation District, August 1990). Wetlands are mapped at reconnaissance level. A sediment study was completed by the U.S. Geological Survey. Investigations or surveys performed in the late 1980s and early 1990s include a septic systems survey, wetlands mapping, and an analysis of logging influences on the basin.

Where urban development has occurred, tributaries have become primarily stormwater conveyances. While most of the streams are in original channels, sections of each stream have been piped or hydrologically altered by incision, erosion or ditching. Rural streams vary from good to poor quality depending on the degree of modification for forest clearing, farming, drained wetlands and residential development. In areas having shallow groundwater, many rural roadside ditches also function as groundwater drainage ditches.

Water quality in Salmon Creek deteriorates dramatically from its headwaters to its confluence with Lake River. Urban stormwater runoff, construction activities, agriculture, livestock, and failing septic systems are all cited by previous investigations as being partly responsible.

Lower Salmon Creek Area

This area comprises urbanized or rapidly urbanizing basins between the Lakeshore area and the Interstate-205 corridor. Each basin or sub area is briefly described and problems are tabulated for the entire area.

Salmon Creek Main Channel

The main channel extends from Mill Creek to Salmon Creek's termination in Lake River. It includes flood plain and unnamed small tributaries and groundwater seeps

that drain from steep hillsides to the flood plain or main channel. Land use is largely residential and open space.

Above Interstate-5, the main channel occupies a relatively narrow canyon incised into a broader terrace comprised of consolidated gravel and terrace gravel. The gravel units form a terrace bounding the flood plain for a distance below Interstate-5. Subdivisions along the ridges above the main channel generally discharge to gullies draining down steep slopes or are piped to the flood plain.

Within the main channel, water quality monitoring shows ongoing problems for sediment, fecal coliform, and turbidity. Low dissolved oxygen during summer may be a more severe problem than currently thought because early morning tests are lacking. Base flow and storm sampling for trace metals at Klineline Pond Park (White and McKenzie, 1979) found metals concentrations in stream base flow that would be expected considering regional groundwater quality data. Fine grained sediment showed elevated lead and mercury concentrations compared to more recent soil testing for Clark County (Washington Department of Ecology, October 1994).

Fish habitat issues center on excessive sediment and loss of riparian habitat in tributaries and the main channel. The main channel was identified by Clark County Conservation District (August 1990) as having the highest potential for salmon and trout production. Specific fish passage barriers are identified on the main channel. A falls at Highway 99 was recently identified as a major fish barrier by the Pubic Works fish barrier study (Clark County, March 1997).

Severe erosion and incision problems occur where runoff is routed to small, steep tributaries. Some landslide problems associated with bank undercutting and flooding are possible.

Cougar Creek

Cougar Creek is an urban drainage that includes commercial development, the Interstate-5 freeway, and extensive residential development.

Cougar Creek is the most studied urban drainage in Salmon Creek basin. A report describing conditions in Cougar Creek in September 1986 (Washington Department of Ecology, June 1987) identified many problems. Cougar Creek has water quality problems due to untreated runoff from residential and commercial development, some sections of the stream are piped under parking lots and major roads, upper parts are ditched and degraded by agriculture. There are probable illicit sewer connections to Cougar Creek. High fecal coliform is a year-round problem in all parts of creek. Septic systems and poor quality groundwater are suspected of contributing to the poor quality of stream base flow. Base flow and storm sampling for trace metals was completed in the late 1970s (White and McKenzie, 1979) This testing found metals concentrations in base flow concentrations that would be expected based on regional groundwater quality data and metals concentrations in storm flow similar to typical stormwater values. Fine grained sediment showed elevated lead and mercury concentrations compared to more recent regional soil testing (Washington Department of Ecology, October 1994).

Fish have not inhabited the creek for many years according to Washington Department of Fish and Wildlife (Washington Department of Ecology, June 1987). A long culvert under an unused road that has an outlet above the stream bed is a fish passage barrier a short distance from the creek mouth. The creek has a series of natural water falls at its mouth that may be a fish barrier.

Suds Creek Basin

Suds Creek basin is adjacent to Cougar Creek basin and has similar land use and water quality problems. A test of base flow in November 1996 showed high nitrate (2.5 mg/l) and relatively low turbidity (3.2 NTU) and considerable fecal coliform (130 MPN/100ml). Sediment deposition has been a long standing complaint on Suds Creek.

Some localized flooding due to inadequate storm sewer capacity is also a problem. Severe incision occurs below Hazel Dell Avenue and is attributed to uncontrolled runoff.

Tenny Creek

Tenny is similar to Cougar and Suds Creek. Field work in November 1996 found that leachate from a chip pile was contaminating the west tributary at 99th St. Fecal coliform in base flow was between 200 and 900 MPN/100ml. Sections of the creek have been piped during development. Runoff from commercial areas and roads is largely untreated.

Several County stormwater control facilities are located in Tenny Creek.

114th Street Tributary

114th Street Tributary is a small urban tributary lacking information to describe it. Problems likely to be similar to other urban creeks in this area.

LaLonde Creek

LaLonde Creek basin is less developed than the others in this area. Problems include riparian habitat loss, channel incision, and uncontrolled runoff from residential, Interstate-5, and commercial areas. Testing of base flow conditions in November 1996 found that fecal coliform were under 100 organisms/100ml, nitrate was 2 mg/l and turbidity was 3 NTU.

Middle Salmon Creek Basin

Middle Salmon Creek comprises basins above the Vancouver urban growth area and below the Cascade Mountains. It includes Mill Creek, the Pleasant Valley area Curtin Creek area, Woodin Creek and Morgan Creek. The main channel is not mapped as a separate area on watershed planning maps, rather it is used as a

boundary between the basins. The main basins include any short tributaries to the main channel.

Main Channel

This section of the main channel extends up into the lower Cascade foothills to the confluence of Salmon and Rock Creeks. Problems include excess sediment and degraded riparian vegetation. Sediment tested at Brush Prairie by the White and McKenzie (1979) showed very low lead concentrations but elevated mercury and copper concentrations compared to native soils. In general, water quality improves greatly above the mouth of Morgan Creek.

Curtin Creek

Curtain Creek is a low gradient, partly-ditched creek that is urbanized in the upper part and has agriculture and rural residential land use in the middle and lower parts. Much of the basin is wetland or drained wetland.

The creek originates in a wetland that discharges good quality water. Curtin Creek is ditched from its origin to about 134th Street where it enters a shallow canyon. Storm sewers are largely pipes and ditches in the upper part. Roadside ditches and field drainage ditches are the main drainage system in the lower part.

The Clark County Conservation District fish habitat report (August 1990) noted an excessive silty sediment and extensive pasture, unfenced from the creek below 119th Street. No salmonids have been reported in Curtin Creek since the late 1950's or early 1960's (Clark County Conservation District, August 1990). The absence is attributed to a lack of pools and high water temperatures during summer. Liechner landfill, a closed landfill in an old gravel pit, has an NPDES industrial stormwater permit for runoff to Curtin Creek.

Pleasant Valley

Pleasant Valley is a developing residential area having several unnamed tributaries draining to Salmon Creek. It is west of Curtin Creek.

Mill Creek

Mill Creek drains a flat upland area north of Salmon Creek that extends to the City of Battle Ground. Mill creek basin also includes several unnamed tributaries flowing directly into Salmon Creek. Mill Creek is largely flat above 179th Street. It is reported to be dry above 179th Street during most summers, but to have been perennial for much of its length prior to 1960 (Clark County Conservation District, August 1990). Much of the area is rural residential land use. However, the Mount Vista area around the WSU campus is low density urban residential.

Habitat loss, channel erosion, livestock, and septic systems appear to be water quality problems in Mill Creek.

Woodin Creek

Woodin Creek is similar to Mill Creek in geography and water quality. It is a perennial stream that drains south from the Battle Ground area and enters a canyon near its mouth. Woodin Creek was the site of a municipal waste water treatment plant serving the City of Battle Ground. The plant ceased discharges to the Creek in April 1993 when flow was routed to the Salmon Creek treatment plant.

Limiting factors for salmonids are few spawning areas, excess sediment, high water temperatures and low base flow during the summer (Clark County Conservation District, August 1990).

Morgan Creek basin

Morgan Creek basin is a largely rural area that drains north to Salmon Creek and includes several unnamed tributaries that drain north to Salmon Creek and the main channel. Morgan Creek originates in the low uplands referred to as the Troutdale Bench. This part of the basin has stream beds within steep valleys. Once the river enters flatlands at Hockinson, the creek is a ditch-like channel with a heavy sediment load.

The Mud Creek tributary is cited as a "massive silt load" and containing animal waste from dairys (Clark County Conservation District, August 1990). In 1989, the creek supported adult salmonids below the 174th Street Culvert. The lower part of the basin is limited for fish habitat by sediment, livestock in the creek, culvert fish barriers, and lack of riffles (Clark County Conservation District, August 1990).

Upper Salmon Creek Basin

This area is the least developed part of Salmon Creek basin and includes uppermost Salmon Creek and the Rock Creek tributary. Forest and rural density land use dominate. The stream bank is largely forested by second growth, but residential development is encroaching in the area. Salmonid are present in Rock Creek and in the north fork tributary to just above Allworth Road (Clark County Conservation District, August 1990).

Whipple Creek - Flume Creek Basins Area

This area comprises two significant drainage basins and numerous small canyons that drain to Lake River. One incorporated city, Ridgefield is located along the northern edge of Flume Creek basin. The basins have similar topography, soils and development rates. In Whipple Creek basin, urban development occurs in the upper basin adjacent to Interstate-5. In Flume Creek basin, development is in and adjacent to the City of Ridgefield in the lower parts of the basin. The balance of the area is farm land, rural residential and forest area.

The area is characterized by flat uplands cut by steep wooded canyons. Underlying rocks are unconsolidated sand and silt that are easily eroded. Stormwater problems center on erosion and sediment problems due to agricultural use and urbanization.

There is little information describing Whipple Creek. Anecdotal accounts from the public and County staff suggest that Whipple Creek has been seriously degraded by urban development in the upper basin. Flume Creek is less developed than Whipple Creek but does include older parts of Ridgefield.

Watershed planning has not yet documented drainage problems in the area. However, they are likely to be similar to lower and middle Salmon Creek areas.

LEWIS RIVER AND TRIBUTARY BASINS

The Lewis River basin includes most of northern Clark County. The major streams are the East Fork Lewis River and Lewis River. Allen Canyon basin empties to the Lewis River near its mouth. Gee Creek actually drains to the Columbia River just south of the Lewis River outfall. It is however part of the Lewis River Water Resource Inventory Area defined by the Washington Department of Ecology.

Gee Creek\Allen Creek Area

Gee Creek headwaters are relatively flat uplands east of Interstate-5. Streams in the basin are cut into this upland and form canyons. Gee Creek enters the Columbia River flood plain and flows though a series of lakes before entering the Columbia River.

Gee Creek basin is about 11,000 acres and predominantly agriculture and forest. Residential areas are centered in Ridgefield. Industrial and commercial zoned land exists in unincorporated areas along Interstate 5

Water quality for Gee Creek is being investigated by Ecology and USFW but a report has not been completed, but it is probably similar to developing basins in Salmon Creek.

Gee Creek basin and Allen Creek basin drainage problems are compiled for a Public Works drainage repair cost estimate program.

The Allen Creek basin is between the Gee Creek basin and the East Fork of the Lewis River basin. It includes several perennial streams draining into Allen Canyon Creek, Mud Lake, and then to the Columbia. There is little information of the water quality of this watershed. Based on field reconnaissance, Mud Lake fits its name and has poor water quality due to sediment and probably excess nutrients. Land uses include gravel mining, agriculture and commercial development along Interstate-5.

East Fork Lewis River

The East Fork basin is an area of approximately 212 square miles in the north-central part of Clark County and western Skamania County, spanning Clark County from east to west. The small towns of La Center and Yacolt are located within the watershed. The East Fork Lewis River flows toward the west for 43 miles from its

headwaters in the Gifford Pinchot National Forest to its confluence with the Lewis River. The eastern part of the watershed is predominantly mountainous, forested land. Average annual flow in the central section of the river is approximately 750 cubic feet per second. Due to the steep slopes, shallow soils, and consolidated volcanic rock, the streams in this area respond quickly to precipitation. The western section of the watershed is much flatter than the eastern section. It is characterized by rolling hills with woodlands and grasslands. The East Fork's main stem gradient lessens and a broad gravel flood plain is formed.

The eastern section of the watershed is relatively pristine. Historically the East Fork been a regionally significant salmonid resource, even though water quality does not fully meet the river's Class AA standards.

The East Fork is exceptional due to its large regional benefits for fisheries, recreational use, and aesthetic enjoyment. State designated beneficial uses that are partially impaired are salmonid spawning and partially impaired salmonid/other fish migration below Moulton Falls due to temperature and thermal modification. The listed sources of the impairment are pasture land, surface mining, mill tailings, and on-site wastewater systems, and unknown sources (1995 305(b) Report). Urban runoff from La Center may be a minor water quality concern in the lower reaches of the river. Gravel and sand mining within the flood plain has been a concern due to sediment production and hydraulic modifications. Nonpoint pollution issues in the East Fork basin are described in a set of four reports by Hutton (Clark County Water Quality Division, August, 1995). Hutton found that agriculture and site development could be associated with water quality degradation and that stable forest lands had the best water quality. McCormick Creek was singled out in terms of water quality because it had the poorest water quality for most of the tested parameters (turbidity, fecal coliform, total suspended solids, nitrate, and total phosphorus).

The East Fork Lewis River Action Plan (Clark County Water Quality Division, August 1995) identified priority areas for each type of impact abatement. For example, McCormick Creek was identified for agriculture impacts. These are being considered by the East Fork Implementation Program.

Flood control and flood plain management is a significant issue on the East Fork because it is a relatively large and dynamic river. Generally, the flood plain is in agriculture, open space or mining land uses. However, some residential development has occurred in areas where there is a risk from flooding and bank undercutting.

North Fork of the Lewis River

The North Fork Lewis River basin in an area of approximately 570 square miles in Clark, Cowlitz, Skamania, and Klickitat counties. The North Fork of the Lewis River is the northern border of Clark County and flows westerly to its confluence with the East Fork. Its average annual flow is 6,100 cubic feet per second. The North Fork is the site of three hydroelectric facilities.

The river section within Clark County is partly fed by three large creeks. Canyon Creek and Siouxon Creek empty into Yale Reservoir. Cedar Creek enters the Lewis below Merwin Reservoir and has no dams inhibiting fish migration. The eastern basin within Clark County is largely mountainous and forested. The western part of the basin within Clark County is much flatter and suitable for agriculture.

Water quality is good in the North Fork. Flooding is a major concern, even though there are major hydroelectric projects. County actions to address flooding are largely to regulate flood plain development.

WASHOUGAL RIVER AND TRIBUTARIES

This area includes the Washougal River and its principle tributaries, the Little Washougal River and Lacamas Creek.

Washougal River Basin

The Washougal River basin includes the Washougal River and Little Washougal River. It drains approximately 50 square miles of southeast Clark County and a larger area within Skamania County. The basin is mainly steep, mountainous, forested land with residential and agricultural areas near the Washougal River's confluence with the Columbia River. The City of Washougal and the City of Camas lie at the mouth of the Washougal River.

Above the confluence of the Little Washougal River and the Washougal River, water quality is very good, while downstream areas are somewhat degraded due to agricultural and residential activities (IRC, 1987). More recent water quality data or studies for the river are lacking.

Drainage concerns on the Washougal center on hazards from flooding in narrow canyons and localized landsides from stream undercutting.

Lacamas Creek Basin

Lacamas Creek and its tributaries drain to Lacamas Lake and ultimately to the Washougal River near the Washougal River outfall to the Columbia. The City of Camas and the unincorporated hamlets of Brush Prairie and Hockinson are the main centers of population within the watershed. Forest, agriculture and low density residential are the primary land uses in Lacamas Creek basin.

Lacamas Creek basin includes extensive areas of drained wetlands. Many of the wetlands in the lower altitude areas have been drained and converted to agriculture and rural residential land use. Much of the upland areas are forested with some rural residential and agriculture uses.

Much of the watershed exhibits high levels of nutrients and fecal coliform. Dairy farming and general agriculture, failing septic systems, stormwater and sediment eroded from construction sites are all partly responsible for excess nutrients and bacteria, but dairies are likely to be a major source (Washington Department of

Ecology, March 1996). The Ecology report suggests that 100 percent implementation of farm practice BMPs is required to help achieve standards for Lacamas Creek. As the basin is developed for residential use, stormwater, and erosion may become proportionally greater pollution sources.

GIBBONS CREEK BASIN - LAWTON CREEK BASIN AREA

The Gibbons Creek Watershed is located in the southeast corner of the County. Until 1992, Gibbons Creek drained into wetlands in the Steigerwald Lake National Wildlife Refuge and the Columbia River. In 1992 Gibbons Creek was realigned to bypass wetlands and be directly connected to the Columbia River. The previous channel exiting the refuge was left as a remnant channel. Gibbons Creek has native runs of several types of salmon and trout.

The remnant channel became a concern after the realignment due to its reduced capacity as a receiving water for storm runoff for industrial facilities and the City of Washougal. A report published in 1996 (Washington Department of Ecology, April 1996) concluded that discharges to the remnant channel should have end-of-pipe standards due to the lack of mixing. NPDES industrial stormwater permits to the remnant channel have numerical limits for several parameters.

Outside of Washougal, mining has had a significant influence on Gibbons Creek and Lawton Creek. Fine sediment is reported to cover gravel beds for stretches of Gibbons Creek. Mining, agriculture and county roads maintenance are cited as sources (Manlow, WDFW, verbal communication, June 1997). The proposed 1998 303(d) listing cites fecal coliform as exceeding standards.

Vancouver South Slope

The Vancouver South Slope is a narrow area, stretching from downtown Vancouver to near Camas that drains directly to the Columbia River. Vancouver south slope is almost entirely within the Vancouver City limits. A small unincorporated area exists where the Fischer rock quarrys have been left outside of the Cities of Camas and Vancouver. Since there are almost no county storm drains or roads in this area, no problem analysis is completed.

APPENDIX C

COMPARISON OF CHAPTER 13.25, STORMWATER CONTROL, CHAPTER 13.27 EROSION CONTROL, AND SENSITIVE LANDS REGULATION TO THE PUGET SOUND MANUAL MINIMUM REQUIREMENTS FOR ALL NEW DEVELOPMENT AND REDEVELOPMENT

February 20 1998

Draft NPDES Program Report

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CONTENTS

COMPARISON OF CHAPTER 13.25, STORMWATER CONTROL, CHAPTER 13.27 EROSION CONTROL, AND SENSITIVE LANDS REGULATION TO THE PUGET SOUND MANUAL MINIMUM REQUIREMENTS FOR ALL NEW DEVELOPMENT AND REDEVELOPMENT

INTRODUCTION AND SUMMARY

INTRODUCTION

Most of the requirements for the Clark County NPDES municipal separate storm sewer permit are taken directly from the general permits for the Puget Sound region. The standard for stormwater and erosion control regulations for new development is the Department of Ecology Stormwater Management Manual for the Puget Sound Basin, commonly referred to as the Puget Sound Manual. Ecology has stated that Clark County does not need to adopt the Puget Manual but have "substantially equivalent" standards (O'brien, Feb. 1996). Substantially equivalent is defined by Ecology Guidance for Local Governments when Submitting Manuals and Associated Ordinances for Equivalency Review (March 1994) as providing an equal or greater level of treatment or protection.

This report lists the minimum requirements from the Puget Sound Manual, Chapter I-2, standards for stormwater and erosion control regulatory programs, then lists the local stormwater, erosion control, and sensitive lands code that is substantially equivalent or notes non-equivalence.

Major differences, or areas of non-equivalence, are listed in the following summary.

SUMMARY

There are three principal chapters of Clark County Code used to control stormwater, control erosion from construction sites, and to protect wetlands from stormwater runoff. Additional protections for sensitive areas are found in the Geologic Hazards Regulations, Chapter 13.60; Habitat Preservation code, Chapter 13.51; and the Critical Aquifer Recharge Area regulations, Chapter 13.70.

Chapter 13.25 Stormwater Control regulates the design, ownership, and maintenance of stormwater controls for new development. The Final Stormwater Plan for each proposal is subject to approval under the standards of the code. Inspection of facilities construction is performed by County inspection and enforcement staff.

Chapter 13.27 Erosion Control was put in place in 1994 as a temporary measure to control sediment problems for new development. The code requires an approved erosion control plan, conforming to standards in 13.27. The plan is implemented by the site developer. Inspection and enforcement of the code is by County inspection and enforcement staff.

Stormwater issues that influence specific sensitive areas such as wetlands and geologically hazardous areas are generally handled in code sections for each sensitive area.

The Clark County Stormwater Control Ordinance, Chapter 13.25, and Erosion Control Ordinance, Chapter 13.27, are generally similar in intent and approach to the minimum requirements, standards, and policies of the Stormwater Manual for the Puget Sound Area (Washington Department of Ecology, February 1992), referred to as the Puget Sound Manual. There are several differences between local code and the Puget Sound Manual which are described in the following section. Puget Sound Manual Minimum Requirements and relevant sections of County code are presented in the main body of the report.

In keeping with the Puget Sound Manual's comprehensive but somewhat complex presentation, there are actually several sets of requirements along with and within the minimum requirements. There are five

small parcel requirements; fifteen erosion and sediment control requirements under the single minimum requirement to implement erosion and sediment controls; a requirement for new development and redevelopment to comply with the 11 minimum requirements; a requirement for redevelopment to implement source controls; the 11 minimum requirements themselves; a section on acceptable exceptions; and a section on the role of experimental BMPs which is omitted from this discussion.

The Puget Sound Manual is the primary technical manual for the County stormwater control and erosion control regulations. However, the manual is used chiefly as technical guidance for the design of BMPs. Clark County minimum requirements are generally stated in the local code.

Major Differences Between County Code and the Puget Sound Manual Minimum Requirements

The following is a listing of the major differences between the requirements of Clark County Code and the minimum requirements in Chapter I-2 of the Puget Sound Manual. Only the minimum requirements where there is probable non-equivalence in local code are listed. The minimum requirement from the Puget Sound Manual is described first, followed by a description or citation of the relevant Clark County Code in ***bold italics***

Small Parcel Minimum Requirements: Erosion Control requirements apply to land disturbing activities of less than one acre. Small parcel requirements include constructed access route, stabilization of denuded areas, protection of adjacent areas, and BMP maintenance.

CC: Chapter 13.27 applies only to land disturbing activities greater than 2000 square feet.

Small Parcel Requirement #2 Stabilization of Denuded Areas, Soil stabilization. All exposed and unworked soils shall be stabilized by suitable application of BMPs, including but not limited to sod or other vegetation, plastic covering, mulching, or application of ground base on areas to be paved. All BMPs shall be selected, designed and maintained in accordance with an approved manual. From October 1 through April 30, no soils shall remain exposed for more than 2 days. From May 1 through September 30, no soils shall remain exposed for more than 7 days.

Subsection 13.27.210(3) requires stabilization in a timely manner. Director can add BMPs in erosion hazard areas and if existing BMPs are inadequate.

Application of Minimum Standards to Redevelopment: This requirement includes the application of source controls to the entire site which is being redeveloped, including adjacent parcels. This requirement also includes applying all minimum requirements for sites where redevelopment occurs, if one or more applies:

- Existing site is greater than 1 acre with 50 percent or more impervious;
- Site discharges to a water body that has a documented water quality problem such as a 305(b) listing; or
- Site is identified in a basin plan or GMA planning as needing additional controls.

CC: No such requirement is in the County Code.

Minimum Requirement # 1: Erosion and Sediment Control: There are fourteen specific requirements for erosion and sediment control. All must be followed. The following Erosion and Sediment Control Requirements list areas where County Code is non-equivalent.

Erosion and Sediment Control Requirement #1: Stabilization and Sediment Trapping: All exposed and unworked soils shall be stabilized by suitable application of BMPs. From October 1 to April 30, no

exposed and unworked soils shall remain unstabilized for more than 2 days. From May 1 to September 30, no exposed and unworked soils shall remain unstabilized for more than 7 days. Prior to leaving the site, stormwater runoff shall pass through a sediment pond or sediment trap, or other appropriate BMPs.

Subsection 13.27.210(3) states that: "All exposed soils shall be stablized, in a timely manner, by suitable application of BMPs, …"

Erosion and Sediment Control Requirement #2: Delineate Clearing and Easement Limits: In the field, mark clearing limits and/or any easements, setbacks, sensitive/critical areas and their buffers, trees and drainage courses.

Chapter 13.27 does not include provisions for marking critical areas or clearing limits. This is handled in other parts of the development regulations. Critical areas buffers are required to be marked during construction for sensitive areas under Chapter 13.36 Wetlands Protection and Chapter 13.60 Geologic Hazards Regulations. Chapter 13.51 Habitat Protection, does not include specific language addressing boundary staking, rather, it describes a process for mitigating development that cannot avoid building in sensitive areas. Any project subject to SEPA would also have conditions of approval that require marking of sensitive areas boundaries.

Erosion and Sediment Control Requirement #4: Timing and Stabilization of Sediment Trapping Measures: Sediment ponds and traps, perimeter dikes, sediment barriers, and other BMPs intended to trap sediment on-site shall be constructed as a first step in grading. These BMPs shall be functional before land disturbing activities take place. Earthen structures such as dams, dikes, and diversions shall be seeded and mulched according to the timing indicated in Erosion and Sediment Control Requirement #1. The Puget Sound Manual sediment control pond is designed for a 10-year 24-hour storm.

CC: Subsection 13.27.210(5) includes the specific requirement: "Prior to leaving sites larger than one acre, stormwater runoff shall pass through a sediment pond, sediment trap, or other appropriate BMP designed to treat the two-year, twenty-four hour storm. Sediment traps alone are not adequate on sites greater than three acres."

Erosion and Sediment Control Requirement #5: Cut and Fill Slopes: Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. In addition, slopes shall be stabilized in accordance with Erosion and Sediment Control Requirement #1.

CC: No specific requirement in Chapter 13.27.

Erosion and Sediment Control Requirement #6: Controlling Off-site Erosion: Properties and waterways downstream from development sites shall be protected from erosion due to increases in the volume, velocity, and peak flow rate of stormwater runoff from the project site.

CC: This refers to controlling increased flow during construction, for which there is no requirement in 13.27.

Erosion and Sediment Control Requirement #7: Stabilization of Temporary Conveyance Channels and Outlets: All temporary on-site conveyance channels shall be designed, constructed and stabilized to prevent erosion from the expected velocity of flow from a 2-year, 24-hour frequency storm for the developed condition. Stabilization adequate to prevent erosion of outlets, adjacent streambanks, slopes and downstream reaches shall be provided at the outlets of all conveyance systems.

CC: No specific requirement in Chapter 13.27.

Erosion and Sediment Control Reqiurement #11: Removal of Temporary BMPs: All temporary erosion and sediment control BMPs shall be removed within 30 days after final site stabilization is

achieved or after the temporary BMPs are no longer needed. Trapped sediment shall be removed or stabilized on site. Disturbed soil areas resulting from removal shall be permanently stabilized.

CC: No similar requirement in Chapter 13.27. This requirement is typically added to erosion control plan sheet notes as a condition of approval.

Erosion and Sediment Control Requirement #12: Dewatering Construction Sites: Dewatering devices shall discharge into a sediment trap or sediment pond.

CC: No similar provisions in Chapter 13.27 or Chapter 13.25.

Erosion and Sediment Control Requirement #13: Control of Pollutants Other Than Sediment on Construction Sites : All pollutants other than sediment that occur on-site during construction shall be handled and disposed of in a manner that does not cause contamination of stormwater.

CC: There is no provision in the erosion control code, Chapter 13.27 to address the source control BMPs described in Chapter II-3 of the Puget Sound Manual.

Erosion and Sediment Control Reqiurement #15: Financial Liability : Performance bonding, or other appropriate financial instruments, shall be required for all projects to ensure compliance with the approved erosion and sediment control plan.

CC: No financial instruments are applied to erosion control compliance, Compliance is by enforcement through Title 32 of the County Code.

Minimum Requirement #4: Runoff Treatment BMPS: Treatment BMPs shall be sized to capture and treat the water quality design storm, defined as the 6-month, 24-hour return period storm.

CC: The treatment storm is defined for Chapter 13.25 using a method derived for the Portland area and is 1/3 of the 2-year 24-hour return period storm. The 6-month 24 hour storm was previously defined locally as 2/3 of the 2-year 24-hour return period storm. The Puget Sound treatment storm is equal to the 24 hour rainfall amount that accounts for 90 percent of the total rainfall during the period of record, or about 2/3 of the two year 24 hour rainfall amount. Clark County uses analysis by the City of Portland Bureau of Environmental Services that examines the size of individual events. The Portland analysis found a design storm equal to one third of the two year 24 hour rainfall would be sufficient to treat about 95 percent of the storms.

Minimum Requirement #8: Off-Site Analysis and Mitigation: All development projects shall conduct an analysis of off-site water quality impacts resulting from the project and shall mitigate these impacts. The analysis shall extend a minimum of one-fourth of a mile downstream from the project. The existing or potential impacts to be evaluated and mitigated shall include, at a minimum, but not be limited to:

(i) excessive sedimentation
(ii) streambank erosion
(iii) discharges to ground water contributing or recharge zones
(iv) violations of water quality standards
(v) spills and discharges of priority pollutants

CC: Under Chapter 13.25, all standards and policies apply only to placing BMPs on the development site.

Exceptions to Minimum Requirements #1 through #10: Exceptions to Minimum Requirements #1 through #10 may be granted prior to permit approval and construction. An exception may be granted following a public hearing, provided that a written finding of fact is prepared, that addresses the following:

(i) The exception provides equivalent environmental protection and is in the overriding public interest; and that the objectives of safety, function, environmental protection and facility maintenance, based upon sound engineering, are fully met;

(ii) That there are special physical circumstances or conditions affecting the property such that the strict application of these provisions would deprive the applicant of all reasonable use of the parcel of land in question, and every effort to find creative ways to meet the intent of the Minimum Requirements has been made;

(iii) That the granting of the exception will not be detrimental to the public health and welfare, nor injurious to other properties in the vicinity and/or downstream, and to the quality of waters of the state; and

(iv) The exception is the least possible exception that could be granted to comply with the intent of the Minimum Requirements.

CC: Section 13.25.320 includes process for obtaining a variance. The criteria for granting a variance are only included for hardship cases and do not appear equivalent to those listed above.

There is an exception that allows the director to reduce the standard for vertical separation for infiltration facilities. Section 13.25.220 Water Quantity Control, Subsection (3) Design Methodology for Quantity Control Facilities:

" (c) The director may allow the base of infiltration facilities to be less than three (3) feet above seasonal high water or an impermeable layer if the quality and quantity control requirements of this chapter can be met".

MINIMUM REQUIREMENTS FROM THE PUGET SOUND MANUAL AND COMPARABLE CLARK COUNTY CODE

Much of this report is text from Chapter I-2 of the Stormwater Management Manual for the Puget Sound Basin (Washington Department of Ecology, February 1992) Sections are added after each minimum requirement to compare Clark County code and programs to the Puget Sound area standard. Throughout this report, guidance to meet the requirements of the 1991 Puget Sound Water Quality Management Plan (as amended) are written in **bold** and supplemental guidelines that serve as advice and other materials are not in bold. The ***bold italics*** describe the County code or program.

I-2.2 EXEMPTIONS (from minimum requirements)

Commercial agriculture, and forest practices regulated under Title 222 WAC, except for Class IV General forest practices that are conversions from timber land to other uses, are exempt from the provisions of the minimum requirements. All other new development is subject to the minimum requirements.

There are no specific exemptions for activities such as forestry other than Class IV, which do not require county development permits. Barns and other agricultural buildings do not require building permits, and therefore do not trigger 13.25.

In Subsection 13.25.120 the code applies to activities that will create more than 2000 square feet of impervious sruface inside the urban growth area and 5000 square feet outside the urban growth area.

13.25.120 Requires specified businesses and industries to add an oil/water separator for addition of more than 1000 feet of non-building impervious surface.

13.25.120 The code applies to replacement of Existing structures exceeding 5000 square feet.

I-2.3 SMALL PARCEL MINIMUM REQUIREMENTS

The following new development shall be required to control erosion and sediment during construction, to permanently stabilize soil exposed during construction, to comply with Small Parcel Requirements 1 through 4, and to prepare a Small Parcel Erosion and Sediment Control Plan:

- **(a) Individual, detached, single family residences and duplexes.**
- **(b) Creation or addition of less than 5,000 square feet of impervious surface area.**
- **(c) Land disturbing activities of less than one acre.**

Objective: The objective of this requirement is to address the cumulative effect of sediment coming from a large number of small sites.

Chapter 13.27, Erosion Control applies to land-disturbing activities greater than 2000 square feet in size and does not apply to agriculture and forestry practices regulated under Title 220 WAC.

SMALL PARCEL REQUIREMENT # 1 Construction Access Route

Construction vehicle access shall be, whenever possible, limited to one route. Access points shall be stabilized with quarry spall or crushed rock to minimize the tracking of sediment onto public roads.

This is in Subsection 13.27.210 of the Erosion Control code.

Supplemental Guidelines: If sediment is inadvertently transported onto public roads, roads shall be cleaned thoroughly at the end of the day by shoveling or sweeping. Street washing should only be done after the bulk of the sediment is removed by sweeping.

This is in Subsection 13.27.210 of the Erosion Control code. Street washing must be approved by the director.

SMALL PARCEL REQUIREMENT #2 Stabilization of Denuded Areas

Soil stabilization. All exposed and unworked soils shall be stabilized by suitable application of BMPs, including but not limited to sod or other vegetation, plastic covering, mulching, or application of ground base on areas to be paved. All BMPs shall be selected, designed and maintained in accordance with an approved manual. From October 1 through April 30, no soils shall remain exposed for more than 2 days. From May 1 through September 30, no soils shall remain exposed for more than 7 days.

Subsection 13.27.210(3) requires stabilization in a timely manner. Director can add BMPs in erosion hazard areas and if existing BMPs are inadequate.

SMALL PARCEL REQUIREMENT #3 Protection of Adjacent Properties

Adjacent properties shall be protected from sediment deposition by appropriate use of vegetative buffer strips, sediment barriers or filters, dikes or mulching, or by a combination of these measures and other appropriate BMPs.

Subsection 13.27.210(4) includes this provision and includes waterbodies along with property.

SMALL PARCEL REQUIREMENT #4 Maintenance

All erosion and sediment control BMPs shall be regularly inspected and maintained to ensure continued performance of their intended function.

Subsection 13.27.210(8) is equal to Small Parcel Requirement 4.

SMALL PARCEL REQUIREMENT #5 Other BMPs

As required by the local Plan Approval Authority, other appropriate BMPs to mitigate the effects of increased runoff shall be applied.

Under Subsection 13.27.200(3), the Director can add BMPs in erosion hazard areas and under Subsection 13.27.200(3), if existing BMPs are inadequate.

I-2.4 NEW DEVELOPMENT AND REDEVELOPMENT - APPLICATION OF MINIMUM REQUIREMENTS

I-2.4.1 New Development

All new development that includes the creation or addition of 5,000 square feet, or greater, of new impervious surface area, and/or land disturbing activity of one acre or greater, shall comply with Minimum Requirements #1 through #11 in Sections I-2.5 through I-2.15 and prepare a Stormwater Site Plan.

All new development that includes the creation or addition of 5,000 square feet, or greater, of new impervious surface area, and land disturbing activity of less than one acre, shall comply with

Minimum Requirements #2 through #11 in Sections I-2.6 through I-2.15 and the Small Parcel Minimum Requirements found in section I-2.2, above. This category of development shall also prepare a Stormwater Site Plan that includes a Small Parcel Erosion and Sediment Control Plan.

This section does not apply to the construction of individual, detached, single family residences and duplexes. Those types of new development are included in the Small Parcel Minimum Requirements.

Objective: The objective of this standard is to define the application of the Minimum Requirements. The objective of these requirements is to reduce pollution and minimize erosion and sedimentation from new development.

Erosion control under Chapter 13.27 applies to all land-disturbing activities greater than 2000 square feet. Stormwater control applies to all new development adding 2000 square feet if impervious surface inside the urban area and 5000 square feet outside the urban area. Addition of 1000 square feet of paved surface for some businesses requires an oil/water separator.

Supplemental Guidelines: Basin planning is encouraged and may be used to tailor certain of the Minimum Requirements to a specific basin (see Minimum Requirement #9). The Minimum Requirements for Small Parcels are found in Section I-2.2. See page I-2-1 for the definition of new development. See Chapter I-3 for a description of Stormwater Site Plans.

Section 13.25.300 provides for basin plans, adopted under requirements of Chapter 36.94 RCW, to supersede standards and policies of Chapter 13.25.

I-2.4.2 Redevelopment

A. Where redevelopment of ³ 5,000 square feet occurs:

The new development Minimum Requirements #1 through #11, Sections I-2.5 through I-2.15, shall apply to that portion of the site that is being redeveloped, and source control BMPs shall be applied to the entire site, including adjoining parcels if they are part of the project. A Stormwater Site Plan shall be prepared.

B. In addition to the above requirements, where one or more of the following conditions apply, a Stormwater Site Plan shall also be prepared that includes a schedule for implementing the Minimum Requirements to the maximum extent practicable, for the entire site, including adjoining parcels if they are part of the project. An adopted and implemented basin plan (Minimum Requirement #9) may be used to develop redevelopment requirements that are tailored to a specific basin.

1. Existing sites greater than 1 acre in size with 50% or more impervious surface.

2. Sites that discharge to a receiving water that has a documented water quality problem. Subject to local priorities, a documented water quality problem includes, but is not limited to water bodies:

(i) Listed in reports required under section 305(b) of the Clean Water Act, and designated as not supporting beneficial uses;

(ii) Listed under section 304(l)(1)(A)(i),304(l)(1)(A)(ii), or 304(l)(1)(B) of the Clean Water Act as not expected to meet water quality standards or water quality goals;

(iii) Listed in Washington State's Nonpoint Source Assessment required under section 319(a) of the Clean Water Act that, without additional action to control nonpoint sources of pollution cannot reasonably be expected to attain or maintain water quality standards.

3. Sites where the need for additional stormwater control measures has been identified through a basin plan, the watershed ranking process underCh. 400-12 WAC, or through Growth Management Act planning.

Objective: The objective of the redevelopment standard is to reduce pollution from existing sites. The long-term goal of this standard is to accomplish this reduction through development and implementation of basin plans.

Section 13.25.120 Applicability, includes: Replacement of existing structures exceeding 5000 square feet on commercial or industrial parcels. Provisions of 13.25 apply only to the proposed development activity. There is no policy or standard in Chapter 13.25 that is equal to I-2.4.2.B.

I-2.5 MINIMUM REQUIREMENT #1: EROSION AND SEDIMENT CONTROL

- **All new development and redevelopment that includes land disturbing activities of≥1 acre shall comply with Erosion and Sediment Control Requirements 1 through 14, below. Compliance with the Erosion and Sediment Control Requirementsshall be demonstrated through implementation of a Large Parcel Erosion and Sediment Control Plan.**

  All new development and redevelopment that includes land disturbing activities of <1 acre shall comply with the Small Parcel Minimum requirements found in section I-2.2, above. Compliance with the Small Parcel Requirements shall be demonstrated through implementation of a Small Parcel Erosion and Sediment Control Plan.

Objective: To control erosion and prevent sediment from leaving the site.

Chapter 13.27, Erosion Control applies to all land disturbing activities of greater than 2000 square feet. The BMP manual is cited as "(a) Chapter II-5 of the Stormwater Management Manual for the Puget Sound Basin developed by the Washington Department of Ecology and dated February 1992; or (b) Section 3 of the Erosion Control Plans Technical Guidance Handbook developed by the city of Portland and Washington County, Oregon and dated November 1989". Policy is to use the Puget Sound Manual.

Supplemental Guidelines:

If an ESC plan is found to be inadequate (with respect to the Erosion and Sediment Control Requirements), then the Plan Approval Authority[1] within the Local Government will require that other BMPs be implemented, as appropriate.

Subsection 13.27.200(2) states that if site BMPs are not sufficient to prevent sediment from reaching adjacent properties, water bodies, or public right-of-ways, the director shall require additional BMPs.

EROSION AND SEDIMENT CONTROL MINIMUM REQUIREMENTS

Guidance to meet the requirements of the 1991 Puget Sound Water Quality Management Plan (as amended) is written in **bold**, and supplemental guidelines that serve as advice and other materials are not in bold. Clark County Code descriptions are in ***bold italic***.

The following erosion and sediment control requirements shall be met:

EROSION AND SEDIMENT CONTROL REQUIREMENT #1 : Stabilization and Sediment Trapping

All exposed and unworked soils shall be stabilized by suitable application of BMPs. From October 1 to April 30, no exposed and unworked soils shall remain unstabilized for more than 2 days. From May 1 to September 30, no exposed and unworked soils shall remain unstabilized for more than 7 days. Prior to leaving the site, stormwater runoff shall pass through a sediment pond or sediment trap, or other appropriate BMPs.

Subsection 13.27.210(3) states that: "All exposed soils shall be stablized, in a timely manner, by suitable application of BMPs, …"

EROSION AND SEDIMENT CONTROL REQUIREMENT #2 : Delineate Clearing and Easement Limits

In the field, mark clearing limits and/or any easements, setbacks, sensitive/critical areas and their buffers, trees and drainage courses.

Chapter 13.27 does not include provisions for marking critical areas or clearing limits. This is handled in other parts of the development regulations. Critical areas buffers are required to be marked during construction for sensitive areas under Chapter 13.36 Wetlands Protection and Chapter 13.60 Geologic Hazards Regulations. Chapter 13.51 Habitat Protection, does not include specific language addressing boundary staking, rather, it describes a process for mitigating development that cannot avoid building in sensitive areas. Any project subject to SEPA would also have conditions of approval that require marking of sensitive areas boundaries.

EROSION AND SEDIMENT CONTROL REQUIREMENT #3 : Protection of Adjacent Properties

Properties adjacent to the project site shall be protected from sediment deposition.

Chapter 13.27 Erosion Control has a specific requirement, Subsection 13.27.210(4), that meets this requirement.

EROSION AND SEDIMENT CONTROL REQUIREMENT #4 : Timing and Stabilization of Sediment Trapping Measures

Sediment ponds and traps, perimeter dikes, sediment barriers, and other BMPs intended to trap sediment on-site shall be constructed as a first step in grading. These BMPs shall be functional before land disturbing activities take place. Earthen structures such as dams, dikes, and diversions shall be seeded and mulched according to the timing indicated in Erosion and Sediment Control Requirement #1.

Subsection 13.27.210(5) includes the specific requirement: Prior to leaving sites larger than one acre, stormwater runoff shall pass through a sediment pond, sediment trap, or other appropriate BMP designed to treat the two-year, twenty-four hour storm. Sediment traps alone are not adequate on sites

greater than three acres. The Puget Sound Manual sediment control pond is designed for a 10 year 24 hour storm.

EROSION AND SEDIMENT CONTROL REQUIREMENT #5 : Cut and Fill Slopes

Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. In addition, slopes shall be stabilized in accordance with Erosion and Sediment Control Requirement #1.

No specific requirement in Chapter 13.27.

EROSION AND SEDIMENT CONTROL REQUIREMENT #6 : Controlling Off-site Erosion

Properties and waterways downstream from development sites shall be protected from erosion due to increases in the volume, velocity, and peak flow rate of stormwater runoff from the project site.

This refers to controlling increased flow during construction. There is no specific requirement in Chapter 13.27.

EROSION AND SEDIMENT CONTROL REQUIREMENT #7 : Stabilization of Temporary Conveyance Channels and Outlets

All temporary on-site conveyance channels shall be designed, constructed and stabilized to prevent erosion from the expected velocity of flow from a 2-year, 24-hour frequency storm for the developed condition. Stabilization adequate to prevent erosion of outlets, adjacentstreambanks, slopes and downstream reaches shall be provided at the outlets of all conveyance systems.

This is not a specific requirement of 13.27 or 13.25.

EROSION AND SEDIMENT CONTROL REQUIREMENT #8 : Storm Drain Inlet Protection

All storm drain inlets made operable during construction shall be protected so that stormwater runoff shall not enter the conveyance system without first being filtered or otherwise treated to remove sediment.

This is a specific requirement of Subsection 13.27.210(6). Also, Subsection 13.25.240(2) of the Storwater control code requires: "Stormwater infiltration systems shall be isolated and protected from sedimentation due to erosion during the construction phase of a development or drainage project. Furthermore, use of infiltration systems shall be minimized until the erodible parts of a site are stabilized with adequate vegetation."

EROSION AND SEDIMENT CONTROL REQUIREMENT #9 : Underground Utility Construction

- **The construction of underground utility lines shall be subject to the following criteria:**

  (i) Where feasible, no more than 500 feet of trench shall be opened at one time.

  (ii) Where consistent with safety and space considerations, excavated material shall be placed on the uphill side of trenches.

  (iii) Trench dewatering devices shall discharge into a sediment trap or sediment pond.

Chapter 13.27, subsection 210(7) has similar requirements:

"Underground Utility Construction. The construction of underground utility lines shall be subject to the following criteria:

(a) The length of trench opened at one time shall be minimized.

(b) Where consistent with safety and space considerations, excavated material shall be placed on the uphill side of trenches.

(c) Trench dewatering devices shall discharge into a sediment trap or sediment pond.

(d) BMPs shall be used to control erosion during and after construction.

(e) BMPs damaged during construction shall be replaced or repaired."

EROSION AND SEDIMENT CONTROL REQUIREMENT #10 : Construction Access Routes

Wherever construction vehicle access routes intersect paved roads, provisions must be made to minimize the transport of sediment (mud) onto the paved road. If sedimentis transported onto a road surface, the roads shall be cleaned thoroughly at the end of each day. Sedimentshall be removed from roads by shoveling or sweeping and be transported to a controlled sediment disposal area. Street washing shall be allowed only after sediment is removed in this manner.

This is a specific requirement of Section 13.27.210, Subsections (1) and (2).

EROSION AND SEDIMENT CONTROL REQUIREMENT #11 : Removal of Temporary BMPs

All temporary erosion and sediment control BMPs shall be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment shall be removed or stabilized on site. Disturbed soil areas resulting from removal shall be permanently stabilized.

No similar requirement in Chapter 13.27. This requirement is typically added to erosion control plan sheet notes as a condition of approval.

EROSION AND SEDIMENT CONTROL REQUIREMENT #12 : Dewatering Construction Sites

Dewatering devices shall discharge into a sediment trap or sediment pond.

No similar provisions in Chapter 13.27 or Chapter 13.25.

EROSION AND SEDIMENT CONTROL REQUIREMENT #13 : Control of Pollutants Other Than Sediment on Construction Sites

All pollutants other than sediment that occur on-site during construction shall be handled and disposed of in a manner that does not cause contamination of stormwater.

There is no provision in the erosion control code, Chapter 13.27 to address the source control BMPs described in Chapter II-3 of the Puget Sound Manual.

EROSION AND SEDIMENT CONTROL REQUIREMENT #14 : Maintenance

All temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to assure continued performance of their intended function. All maintenance and repair shall be conducted in accordance with an approved manual.

Chapter 13.27, Subsection 210(8) states: "All erosion and sediment control BMPs shall be regularly inspected and maintained by the property owner or permit holder to ensure continued performance of their intended function. (Exh. A of Ord. 1994-12-25)." Section 13.27.130 defines the BMP manual as "(a) Chapter II-5 of the Stormwater Management Manual for the Puget Sound Basin developed by the

Washington Department of Ecology and dated February 1992; or (b) Section 3 of the Erosion Control Plans Technical Guidance Handbook developed by the city of Portland and Washington County, Oregon and dated November 1989". Policy is to use the Puget Sound Manual.

EROSION AND SEDIMENT CONTROL REQUIREMENT #15 : Financial Liability

Performance bonding, or other appropriate financial instruments, shall be required for all projects to ensure compliance with the approved erosion and sediment control plan.

No financial instruments are applied to erosion control compliance, Compliance is by enforcement through Title 32 of the County Code.

I-2.6 MINIMUM REQUIREMENT #2: PRESERVATION OF NATURAL DRAINAGE SYSTEMS

Natural drainage patterns shall be maintained, and discharges from the site shall occur at the natural location, to the maximum extent practicable.

Objective: To preserve and utilize natural drainage systems to the fullest extent because of the multiple stormwater benefits these systems provide.

In Chapter 13.25, Subsection 220(1) are the following requirements: " (1) General Standards.
(a) All projects shall provide quantity control of stormwater runoff in accordance with the requirements of this section.
(b) Natural drainage flow routes through streams shall be maintained, and discharges from the site shall occur at the natural location and elevation, to the maximum extent practical.
(c) Transfer of runoff from one basin to another shall not be allowed."

Supplemental Guidelines: Natural drainage systems provide many water quality benefits and should be preserved to the fullest extent possible. In addition to conveying and attenuating stormwater runoff, these systems are less erosive, provide ground water recharge, and support important plant and wildlife resources. Effective utilization of the natural system can maintain environmental and aesthetic attributes of a site as well as be a cost-effective measure to convey stormwater runoff.

Sensitive lands code includes protections for riparian habitat and wetlands.

I-2.7 MINIMUM REQUIREMENT #3: SOURCE CONTROL OF POLLUTION

Source control BMPs shall be applied to all projects to the maximum extent practicable. Source control BMPs shall be selected, designed, and maintained according to an approved manual.

An adopted and implemented basin plan (Minimum Requirement #9) may be used to develop source control requirements that are tailored to a specific basin, however, in all circumstances, source control BMPs shall be required for all sites.

Objective: The intention of source control BMPs is to prevent stormwater from coming in contact with pollutants. They are a cost effective means of reducing pollutants in stormwater, and, therefore, should be a first consideration in all projects.

Supplemental Guidelines: A list of many source control BMPs is provided in the BMP selection chapter, Chapter I-4. For construction sites see Chapter II-5; for post-construction development sites see Volume III; for specific urban land uses see Volume IV.

Chapter 13.25, Subsection 210(4) specifies source control BMPs from Chapter IV-2, IV-3, and IV-4 of the Puget Sound Manual. Chapter 13.27 Erosion Control specifies erosion control BMPs from Chapter II-5 of the Puget Sound Manual or the Erosion Control Technical Guidance Handbook for the City of Portland and Washington County, Oregon. Policy is to use the Puget Sound Manual.

I-2.8 MINIMUM REQUIREMENT #4: RUNOFF TREATMENT BMPS

All projects shall provide treatment of stormwater. Treatment BMPs shall be sized to capture and treat the water quality design storm, defined as the 6-month, 24-hour return period storm. The first priority for treatment shall be to infiltrate as much as possible of the water quality design storm, only if site conditions are appropriate and ground water quality will not be impaired. Direct discharge of untreated stormwater to ground water is prohibited. All treatment BMPs shall be selected, designed, and maintained according to an approved manual.

"Section 13.25.210 Water Quality Treatment:

(1) General Standards.

(a) All projects shall provide treatment of stormwater runoff through the use of BMPs specified in this section.

(b) Treatment BMPs shall be sized to capture, hold and treat the water quality design storm, defined as one-third (1/3) of the two (2) year, twenty-four (24) hour storm runoff volume.

(c) If site conditions are appropriate and groundwater quality will not be impaired, infiltration is the preferred BMP. All discharges to groundwater shall comply with the following state laws: the Water Pollution Control Act (90.48 RCW), the Water Resources Act (90.54 RCW), and Water Quality Standards for Ground Waters of the State of Washington (WAC 173-200). Infiltration may be limited near public water supply wells.

(d) The BMPs cited in this section shall be sited, designed and constructed in accordance with the requirements detailed in the Puget Sound Manual for each BMP, with the following exceptions:

(i) For biofiltration swales (RB.05) and vegetative filter strips (RB.10) alternative design criteria from the publication "Biofiltration Swale Performance, Recommendations, and Design Considerations-Appendix G" by the Municipality of Metropolitan Seattle, Water Pollution Control Department, dated October 5, 1992 shall be used.

(ii) Where provisions of this chapter conflict with the Puget Sound Manual or other cited design guidance, this chapter shall take precedence.

(e) All discharges to surface waters shall comply with the following state laws: the Water Pollution Control Act (90.48 RCW) and Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A).

(f) Except within the Lacamas Basin, treatment of runoff from sidewalks and bike paths is not required if the stormwater drains away from roadways. Runoff from sidewalks and bike paths that mix with roadways will require treatment.

(2) Standard BMPs.

(a) Standard stormwater treatment BMPs shall be used to treat stormwater throughout Clark County, except for certain projects in the Lacamas watershed as noted in Section 13.25.210(3)(a).

(b) Acceptable standard treatment BMPs include the following from the Puget Sound Manual (Chapters III-3, III-4, and III-6):

(i) RI.05 WQ Infiltration basin;
(ii) RI.10 Infiltration trench;
(iii) RI.15 Roof downspout system;
(iv) RD.09 Constructed wetland;
(v) RD.06 Wet pond with marsh;
(vi) RD.05 Wet pond without marsh;
(vii) RB.05 Biofiltration swale;
(viii) RB.10 Vegetative filter strip;

(ix) RF.05 Sand filtration basin;

(x) RF.10 Sand filtration trench.

(c) Sand filtration BMPs (RF.05 and RF.10) are not allowed on commercial or industrial sites where the effluent from the treatment systems will drain to groundwater.

(d) For biofiltration swales and vegetative filter strips, the hydraulic residence used for design shall be no less than nine (9) minutes. Swale slopes, however, may be no less than one-half percent (.5%).

(e) Infiltration BMPs shall not be used as temporary erosion control devices.

(f) Alternative roof downspout systems that provide an equivalent level of performance to the system in the Puget Sound Manual (RI.15) may be approved by the director. Roof downspout systems can be constructed without observation wells".

Under standard BPMs, Subsection 13.25.210(2):

" (d) For biofiltration swales and vegetative filter strips, the hydraulic residence used for design shall be no less than nine (9) minutes. Swale slopes, however, may be no less than one-half percent (.5%)".

Infiltration is also required under quantity controls in Subsection 13.25.220(3):

"(f) Residential and commercial structures shall be designed to direct roof runoff to downspout roof systems in areas that contain soil groups A, B and C, where the infiltration rate is equal to or greater than four (4) inches per hour. The system shall be designed to discharge the two (2) year developed storm into the ground. For design purposes one-half (1/2) of the infiltration rate shall be used. Percolation tests shall be provided for all proposed roof downspout systems prior to final stormwater plan approval. Short plats, subdivisions of four lots or less and single-family home construction on lots of record may utilize the SCS infiltration rates for design purposes. Infiltration is not required in areas having steep slopes as defined in Section 13.25.130(23)".

Stormwater treatment BMPs shall not be built within a natural vegetated buffer, except for necessary conveyance systems as approved by the local government.

Development in vegetated buffers and sensitive areas is regulated under Chapter 13.36 Wetlands Protection and 13.60 Geologic Hazard Regulations. Also, building a stormwater facility within a shoreline area under the shorelines combining district (Chapter 18.330) would require meeting all of the standards and policies of the local shorelines plan and Chapter 173-27 WAC.

Requirements under Chapter 13.36, Subsection 415(3), permit facilities in certain wetland buffers provided it does not degrade the buffer and is designed to blend with the natural landscape. Under Chapter 13.60 Geologic Hazard Regulations, no stormwater facilities would be allowed in designated geologic hazard area buffers for slope-stability related hazards.

An adopted and implemented basin plan (Minimum Requirement #9)may be used to develop runoff treatment requirements that are tailored to a specific basin.

Section 13.25.300 allows for basin plans that are strategies to protect and enhance surface and ground water in a watershed, to supersede standards and policies of Chapter 13.25. Infiltration of treated runoff is a primary stormwater management policy of Clark County Watershed Plans for Burnt Bridge Creek basin and the Salmon Creek/Lakeshore Area.

Objective: The purpose of runoff treatment is to reduce pollutant loads and concentrations in stormwater runoff using physical, biological, and chemical removal mechanisms. When site conditions are appropriate infiltration can potentially be the most effective BMP for runoff treatment.

I-2.9 MINIMUM REQUIREMENT #5: STREAMBANK EROSION CONTROL

The requirement below applies only to situations where stormwater runoff is discharged directly or indirectly to a stream, and must be met <u>in addition</u> to meeting the requirements in Minimum Requirement #4, Runoff Treatment BMPs:

Other than projects exempted by Subsection 13.25.220(5) all new development regulated by Chapter 13.25 must meet streambank erosion standards of Section 13.25.220.

Subsection 13.25.220(5) "Discharge to Large Water Bodies. Projects meeting all the following criteria are exempt from the quantity control requirements of subsections (3)(d) and (e) of this section:

(a) The runoff from the project directly enters one of the following water bodies through a pipe or other approved discharge structure:

(i) Columbia River;
(ii) Lacamas and Round Lakes;
(iii) North Fork Lewis River;
(iv) Vancouver Lake;
(v) Lake River."

Stormwater discharges to streams shall control streambank erosion by limiting the peak rate of runoff from individual development sites to 50 percent of the existing condition 2-year, 24-hour design storm while maintaining the existing condition peak runoff rate for the 10-year, 24-hour and 100-year, 24-hour design storms. As the first priority, streambank erosion control BMPs shall utilize infiltration to the fullest extent practicable, only if site conditions are appropriate and ground water quality is protected. Streambank erosion control BMPs shall be selected, designed, and maintained according to an approved manual.

Standards for the stream bank erosion control facility in Subsection 13.25.220(3) are:

" (d) For surface runoff leaving a development site, the following criteria shall be met:

(i) The peak release rate for the two (2) year design storm after development shall not exceed one-half (½) the predeveloped two (2) year design storm peak runoff rate.

(ii) The peak release rate for the ten (10) and one hundred (100) year design storms after development shall not exceed the respective predevelopment design storm peak rates.

(iii) After meeting the requirements of (i) and (ii) above, the pond volume shall be increased by either the following multiplication factor F: F = (composite curve number /46)-0.6 or by using Figure III-1.1 in section III of the Puget Sound Manual. This correction factor is to be applied to the volume of the pond without changing its depth or the design of its outlet structure, which shall result in an increase in surface area."

Predevelopment is defined in Subsection 13.25.220(2) as:

(i) Predevelopment land use shall be established as the use over the last thirty (30) years which results in the least amount of site runoff, as demonstrated by evidence acceptable to the director. Acceptable evidence may include, but not be limited to: 1968 aerial photos, crop history or tax assessor records.

(ii) Development activities involving replacement of existing commercial and industrial facilities on development sites less than ten thousand (10,000) square feet in area can assume predevelopment land use equivalent to the facility being replaced.

Stormwater treatment BMPs shall not be built within a natural vegetated buffer, except for necessary conveyance systems as approved by the local government.

See discussion of vegetated buffers in Minimum Requirement #4

An adopted and implemented basin plan (Minimum Requirement #9)may be used to develop streambank erosion control requirements that are tailored to a specific basin.

See discussion of basin plans under Minimum Requirement #4.

Objective: To reduce streambank erosion which results from increased runoff due to development. The standard is intended to reduce the frequency and magnitude of bankfull flow conditions, which are highly erosive and increase dramatically as a result of development. Conventional flood detention practices do not adequately control streambank erosion because only the peak rate of flow is decreased, not the *frequency* and *duration* of bankfull conditions.

Supplemental Guidelines: See Chapter III-4. Reduction of flows through infiltration decreases streambank erosion and helps to maintain base flow throughout the summer months. However, infiltration should only be used where ground water quality is not threatened by such discharges. The use of an artificial treatment system, such as an aquatard (see Chapter III-3) shall be considered in areas with highly permeable soils. Treatment of the water quality design storm must be accomplished prior to discharge to these soils. If highly permeable soils are present they should be utilized for streambank erosion control by infiltrating flows greater than the water quality design storm.

See discussion of the use of infiltration under Minimum Requirement #4.

I-2.10 MINIMUM REQUIREMENT #6: WETLANDS

The requirements below apply only to situations where stormwater discharges directly or indirectly through a conveyance system into a wetland, andmust be met in addition to meeting the requirements in Minimum Standard #4, Runoff Treatment BMPs.

> **(a) Stormwater discharges to wetlands must be controlled and treated to the extent necessary to meet the State Water Quality Standards, Ch. 173-201 WAC, or Ground Water Quality Standards, Ch. 173-200 WAC, as appropriate.**

Under 13.25.210(1), All projects must provide water quality treatment.

> **(b) Discharges to wetlands shall maintain the hydroperiod and flows of existing site conditions to the extent necessary to protect the characteristic uses of the wetland. Prior to discharging to a wetland, alternative discharge locations shall be evaluated, and natural water storage and infiltration opportunities outside the wetland shall be maximized.**

Standards as conditions for approval of a wetland permit included under Section 13.36.410 Wetlands protection:
" Wetland permit applications shall be based upon an enhancement/mitigation plan and shall satisfy the following general requirements:
(1) The proposed activity shall not cause significant degradation of groundwater or surface- water quality or fish and wildlife habitat;
(2) The proposed activity shall comply with all state, local and federal laws, including those related to sediment control, pollution control, floodplain restrictions, stormwater management, and on-site wastewater disposal;
(3) Wetland and wetland buffer impacts shall be minimized. (Sec. 1 of Ord. 1992-02-03)"

Under Subsection 13.25.220(3), part d, surface runoff discharges leaving a site are regulated to prevent stream bank erosion. See Minimum Requirement #5.

> **(c) Created wetlands that are intended to mitigate for loss of wetland acreage, function and value shall not be designed to also treat stormwater.**

Under Section 13.36.130, exemptions from wetland regulation, created wetlands that are intended to mitigate loss are not exempted from regulation and would not be allowed to become stormwater facilities.

> **(d) In order for constructed wetlands to be considered treatment systems, they must be constructed on sites that are not wetlands and they must be managed for stormwater treatment. If these systems are not managed and maintained in accordance with an approved manual for a period exceeding three years these systems may no longer be considered constructed wetlands. Discharges from constructed wetlands to waters of the state (including discharges to natural wetlands) are regulated under Ch. 90.48 RCW, Ch. 173-201 WAC, and Ch. 173-200 WAC.**

Under Chapter 13.25, Section 210, water quality treatment, Puget Sound Manual BMP RD.09 Constructed wetland, is cited as a an acceptable BMP. This would include the design and management requirements of the State Standard. In addition, Section 13.25.230, Maintenance and ownership, includes provisions for initial (subsection 2) and long-term (subsection 3) maintenance of facilities that will be dedicated to the county and those that will be privately maintained.

> **(e) Stormwater treatment BMPs shall not be built within a natural vegetated buffer, except for necessary conveyance systems as approved by the local government.**

Under 13.36.415(4): "Stormwater Management Facilities. Stormwater management facilities are only allowed in Type B, C, and D buffers, provided the facilities will not degrade the buffer and are designed to blend with the natural landscape;" Buffers that fall into the B, C, or D category are disturbed or not fully covered in mature native vegetation.

An adopted and implemented basin plan (Minimum Requirement #9)may be used to develop requirements for wetlands that are tailored to a specific basin.

Objective: To ensure that wetlands receive the same level of protection as any other waters of the state. Wetlands are extremely important natural resources which provide multiple stormwater benefits, including ground water recharge, flood control, and streambank erosion protection. They are easily impacted by development unless careful planning and management are conducted. Wetlands can be severely degraded by stormwater discharges from urban development due to pollutants in the runoff and also due to disruption of natural hydrologic functioning of the wetland system. Changes in water levels and the duration of inundations are of particular concern.

I-2.11 MINIMUM REQUIREMENT #7: WATER QUALITY SENSITIVE AREAS

Where local governments determine that the Minimum Requirements do not provide adequate protection of water quality sensitive areas, either on-site or within the basin,more stringent controls shall be required to protect water quality.

Stormwater treatment BMPs shall not be built within a natural vegetated buffer, except for necessary conveyance systems as approved by the local government.

An adopted and implemented basin plan (Minimum Requirement #9)may be used to develop requirements for water quality sensitive areas that are tailored to a specific basin.

Objective: To ensure protection of water quality in sensitive areas.

Supplemental Guidelines: Water quality sensitive areas are areas that are sensitive to a change in water quality, including but not limited to, lakes, ground water management areas, ground water special

protection areas, sole source aquifers, critical aquifer recharge areas, well head protection areas, closed depressions, fish spawning and rearing habitat, wildlife habitat, and shellfish protection areas. Areas such as steep or unstable slopes or erosive stream banks which can cause water quality problems should also be included. Water quality sensitive areas may be identified through jurisdiction-wide inventories, the watershed planning process required under Ch. 400-12 WAC, critical area designation in accordance with Ch. 365-190 WAC, local drainage basin planning, and/or on a site-by-site basis (e.g. using a threshold determination under SEPA).

All GMA sensitive areas are identified on maps that are adopted into code regulating activities in each sensitive area and by definition within regulations for each sensitive area.

See discussions of building stormwater facilities in vegetated buffers under Minimum Requirements #4, #5, and #6.

To improve Lacamas Lake, under the stormwater control code, 13.25.210(3) (a) Advanced control of nutrients is required in the Lacamas watershed (as delineated on the Clark County Watershed Map, attached to the ordinance codified in this chapter and on file in the commissioner's office) above the dam at the south end of Round Lake, for all development activities exceeding one (1) acre in size with stormwater discharges to surface waters.
(b)

I-2.12 MINIMUM REQUIREMENT #8: OFF-SITE ANALYSIS AND MITIGATION

All development projects shall conduct an analysis of off-site water quality impacts resulting from the project and shall mitigate these impacts. The analysis shall extend a minimum of one-fourth of a mile downstream from the project. The existing or potential impacts to be evaluated and mitigated shall include, at a minimum, but not be limited to:

- **(i) excessive sedimentation**
- **(ii) streambank erosion**
- **(iii) discharges to ground water contributing or recharge zones**
- **(iv) violations of water quality standards**
- **(v) spills and discharges of priority pollutants**

Objective: To ensure that future impacts from the project will be controlled and/or existing impacts will not be aggravated by the project.

Chapter 13.25 does not include provisions for requiring an off-site analysis.

I-2.13 MINIMUM REQUIREMENT #9: BASIN PLANNING

Adopted and implemented watershed-based basin plans may be used to modify any or all of the Minimum Requirements, provided that the level of protection for surface or ground water achieved by the basin plan will equal or exceed that which would be achieved by the Minimum Requirements in the absence of a basin plan. Basin plans shall evaluate and include, as necessary, retrofitting of BMPs for existing development and/or redevelopment in order to achieve watershed-wide pollutant reduction goals. Standards developed from basin plans shall not modify any of the above requirements until the basin plan is formally adopted and fully implemented by local government. Basin plans shall be developed according to an approved manual.

Objective: To promote watershed-based planning as a means to develop and implement comprehensive water quality protection measures. Primary objectives of basin planning are to reduce pollutant loads and hydrologic impacts to streams and wetlands.

In the definititions in Chapter 13.25: "Basin plan" means a stormwater management plan adopted by the board and meeting the requirements of RCW Chapter 36.94".

From Chapter 13.25 Stormwater Control:

Section 13.25.300 Basin plans.

(1) Basin plans are strategies for a watershed designed to protect and enhance surface and groundwater within a watershed.

(2) Where conflicts occur, the policies and standards in a basin plan shall supersede the other requirements of this chapter.

(3) To be valid, basin plans must be stamped by a registered professional engineer, adopted by the Board, meet the requirements of RCW Chapter 36.94, and incorporated into this chapter.

(4) Adopted basin plans are identified beginning in Section 13.25.500 of this chapter. (Sec. 1 of Ord. 1994-01-47; amended by Sec. 1 of Ord. 1995-12-33)

Supplemental Guidelines: While Minimum Requirements #3 through #7 establish protection standards for individual sites, they do not evaluate the overall pollution impacts and protection opportunities which could exist at the watershed level. In order for a basin plan to serve as a means of modifying the minimum requirements it must be formally adopted by all jurisdictions that have responsibilities under the basin plan, and construction and regulations called for by the plan must be complete. This is what is meant by an adopted and implemented basin plan.

Basin planning provides a mechanism by which the on-site standards can be evaluated and refined based on an analysis of an entire watershed. Basin plans are especially well-suited to develop control strategies to address impacts from future development and to correct specific problems whose sources are known or suspected. Basin plans can be effective at addressing both long-term cumulative impacts of pollutant loads and short-term acute impacts of pollutant concentrations, as well as hydrologic impacts to streams and wetlands.

In general, the standards established by basin plans will be site-specific but may be augmented with regional solutions for Source Control (Minimum Requirement #2) and Streambank Erosion Control (Minimum Requirement #4).

I-2.14 MINIMUM REQUIREMENT #10: OPERATION AND MAINTENANCE

An operation and maintenance schedule shall be provided for all proposed stormwater facilities and BMPs, and the party (or parties) responsible for maintenance and operation shall be identified.

Objective: To ensure that stormwater control facilities are adequately maintained and operated properly.

Supplemental Guidelines: Inadequate maintenance is likely the leading cause of failure for stormwater control facilities. The description of each BMP in Volume II and III includes a section on maintenance. The Guidance Manual also includes a section on developing an operation and maintenance program and a model operation and maintenance ordinance.

Approval of facilities is subject to the following conditions under Section 13.25.230 of the Stormwater Control Code:

"13.25.230 Maintenance and ownership.

(1) County Ownership of Stormwater Facilities.

(a) Stormwater facilities located within public road rights-of-way shall be owned by the county.

(b) County ownership of stormwater facilities outside public road rights-of-way is not required where the applicant demonstrates to the satisfaction of the director that the stormwater facilities can be adequately maintained by private parties.

(c) County ownership of stormwater facilities is required where the county will assume long-term maintenance of the facilities.

(2) Initial Maintenance.

(a) To insure satisfactory operation of new stormwater facilities, the applicant constructing the facility shall maintain it for two (2) years after completion of the project.

(b) In cases where the stormwater facility is within a public road right-of-way or on land owned by the county, the applicant constructing the facility, after satisfactory completion of the stormwater facilities and as a condition of acceptance of such facilities by the county, shall commence a two (2) year period of maintenance of the facility. The applicant shall satisfactorily maintain the facility and repair any failure within this two (2) year period. Additionally, the applicant shall post and maintain a maintenance bond or other security acceptable to the director during this two (2) year initial maintenance period. The purpose of the maintenance bond is to cover the cost of design defects or failures in workmanship of the facilities. The amount of the maintenance bond shall be ten percent (10%) of the construction cost of the stormwater facilities.

(3) Long-Term Maintenance.

(a) The county shall provide long-term maintenance of new stormwater facilities under any of the following situations:

(i) Facilities located in public road rights-of-way; or

(ii) Facilities dedicated to the county.

(b) If the county provides long-term maintenance of a stormwater facility, all the following requirements shall be met:

(i) The requirements in Section 13.25.230(2) shall be completed;

(ii) The facilities shall be inspected and approved by the director prior to acceptance. Required remedial work to correct design and construction deficiencies shall be completed by the project developer prior to acceptance; and

(iii) All necessary ownerships and easements entitling the county to properly access and maintain the facility shall be conveyed to the county and recorded with the county auditor.

(c) For stormwater facilities for which the county will not provide long-term maintenance, the applicant shall make arrangements with the existing or future (as appropriate) occupants or owners of the subject property for assumption of maintenance in a manner subject to the approval of the director. Such arrangements shall be approved prior to county approval of the final stormwater plan and completed prior to the end of the two (2) year initial maintenance period of the applicant's responsibility or in the case of plats, prior to the time of recording.

(d) The county shall inspect privately maintained facilities for compliance with the requirements of this chapter. If the parties responsible for long-term maintenance fail to maintain their facilities to acceptable standards, the county shall issue a written notice specifying required actions to be taken in order to bring the facilities into compliance. If these actions are not performed in a timely manner, the county shall perform this maintenance and bill the parties responsible for the maintenance in accordance with Section 32.04.060 of this code.

(e) Easements or a covenant acceptable to the director shall be provided to the county for purposes of inspection of privately maintained facilities. The minimum dimensions of easements for stormwater facilities are as follows:

(i) Sufficient width around a treatment or storage pond to encompass the pond plus the additional area necessary for equipment access;

(ii) Pond design and easements shall allow access to all areas within the pond by standard maintenance equipment vehicles;

(iii) Widths of easements for conveyance facilities shall be as detailed in Section 13.25.220(4)(l) and (m).

(f) Final plats shall include a note specifying the party(s) responsible for long-term maintenance of stormwater facilities. (Sec. 1 of Ord. 1994-01-47; amended by Sec. 5 of Ord. 1994-10-23; amended by Sec. 1 of Ord. 1995-12-33)."

I-2.15 MINIMUM REQUIREMENT #11: FINANCIAL LIABILITY

Performance bonding or other appropriate financial instruments shall be required for all projects to ensure compliance with these standards.

Objective: To ensure that development projects have adequate financial resources to fully implement stormwater management plan requirements and that liability is not unduly incurred upon local governments.

See the Code cited in Minimum Requirement #10.

I-2.16 EXCEPTIONS

Exceptions to Minimum Requirements #1 through #10 may be granted prior to permit approval and construction. An exception may be granted following a public hearing, provided that a written finding of fact is prepared, that addresses the following:

(i) The exception provides equivalent environmental protection and is in the overriding public interest; and that the objectives of safety, function, environmental protection and facility maintenance, based upon sound engineering, are fully met;

(ii) That there are special physical circumstances or conditions affecting the property such that the strict application of these provisions would deprive the applicant of all reasonable use of the parcel of land in question, and every effort to find creative ways to meet the intent of the Minimum Requirements has been made;

(iii) That the granting of the exception will not be detrimental to the public health and welfare, nor injurious to other properties in the vicinity and/or downstream, and to the quality of waters of the state; and

(iv) The exception is the least possible exception that could be granted to comply with the intent of the Minimum Requirements.

Supplemental Guidelines: Ecology encourages the Plan Approval Authority to impose additional or more stringent criteria as appropriate for their area. Additionally, criteria which may be inappropriate or too restrictive for an area may be modified through basin planning (Minimum Requirement #9). Modification of any of the minimum requirements which are deemed inappropriate for the site may be done by granting an exception.

The exception procedure is an important element of the plan review and enforcement programs. It is intended to maintain a necessary flexible working relationship between local officials and applicants. Plan Approval Authorities should consider these requests judiciously, keeping in mind both the need of the applicant to maximize cost-effectiveness and the need to protect off-site properties and resources from damage.

From Chapter 13.25, Subsection 200(2) Preliminary Stormwater Plan:

"(e) Modification of Content Requirements. The director may waive in writing some or all of the content requirements in the preliminary stormwater plan if:

(i) The development activity or drainage project is included in an approved final stormwater plan which meets the requirements of this chapter; or

(ii) A basin plan exists that makes some of the information irrelevant".

From Chapter 13.25, Subsection 200(3) Preliminary Stormwater Plan:

"(e) Modification of Content Requirements. The director may waive, in writing, some of the content requirements in the final stormwater plan if:

(i) The development activity or drainage project is included in an approved final stormwater plan which meets the requirements of this chapter and the applicant demonstrates to the satisfaction of the director that the applicable provisions of the previously approved final stormwater plan will be met; or

(ii) The director determines, upon receipt of a letter of request from the applicant, that less information is required to accomplish the purposes of this chapter;

(iii) A basin plan exists that makes some of the information irrelevant".

From Section 13.25.220 Water Quantity Control, Subsection (3) Design Methodology for Quantity Control Facilities:

" (c) The director may allow the base of infiltration facilities to be less than three (3) feet above seasonal high water or an impermeable layer if the quality and quantity control requirements of this chapter can be met".

FromChapter 13.25, Article III. Exceptions and Special Cases

"13.25.300 Basin plans.

(1) Basin plans are strategies for a watershed designed to protect and enhance surface and groundwater within a watershed.

(2) Where conflicts occur, the policies and standards in a basin plan shall supersede the other requirements of this chapter.

(3) To be valid, basin plans must be stamped by a registered professional engineer, adopted by the Board, meet the requirements of RCW Chapter 36.94, and incorporated into this chapter.

(4) Adopted basin plans are identified beginning in Section 13.25.500 of this chapter. (Sec. 1 of Ord. 1994-01-47; amended by Sec. 1 of Ord. 1995-12-33)

13.25.310 Regional and subregional facilities.

(1) If regional or subregional facilities are used to meet some or all of the standard requirements of Article II, the following conditions shall be met:

(a) Stormwater runoff shall be transported from a development site to a regional/subregional facility through a pipe or man-made open channel conveyance system.

(b) If the regional/subregional facility does not yet exist, interim quantity control and treatment methods shall be used to meet the standard requirements of Article II. All interim methods shall be reviewed and shall require written approval by the director.

(c) The facility must have sufficient capacity to provide the treatment and quantity control specified in Article II.

(d) A written commitment from the owner of the facility, or the director in the case of county-owned facilities, shall be provided that allows use of the facility by the applicant.

(e) The county encourages multiple users of stormwater facilities. Review of designs of these types of facilities shall be expedited by the county and receive priority review.

(2) Where a stormwater utility exists, a system development charge can be assessed for use of a regional/subregional facility. (Sec. 1 of Ord. 1994-01-47; amended by Sec. 1 of Ord. 1995-12-33)

13.25.320 Variances.

(1) General.

(a) Variance requests require a public hearing before a Clark County hearing examiner. Notice and appeal requirements will be the same as those provided for preliminary subdivision plat applications pursuant to Section 17.301.070 of this code.

(b) Variances shall be valid only for the life of the land use application permit or approval.

(2) Variances Hardship. If application of the standard requirements of Article II will preclude all reasonable use of a parcel, an applicant can make a written request for a waiver from some or all of the standard requirements of Article II. For the variance request to be considered, the applicant must demonstrate all of the following:

(a) The proposed activities will not cause significant degradation of groundwater or surface water quality;

(b) The proposed activities comply with all state, local and federa l laws, including those related to sediment control, pollution control, floodplain and floodway restrictions, and wetland protection;

(c) No material damage to nearby public or private property nor significant threat to the health or safety of people on or off the property will occur; and

(d) The inability to derive any reasonable use of the property is not the result of actions by the applicant in segregating or dividing the property and creating the undevelopable condition after the effective date of the ordinance codified in this chapter.

(3) Variances requests that deviate by less than ten percent (10%) may be approved by utilizing a Type I procedure upon a finding that water quality and quantity will not be materially affected. (Sec. 1 of Ord. 1994-01-47; amended by Sec. 1 of Ord. 1995-12-33)

13.25.330 Governmental agency projects.

The bonding and insurance requirements of Section 13.25.240(6) shall be waived for development activities and drainage projects undertaken by governmental agencies. (Sec. 1 of Ord. 1994-01-47; amended by Sec. 1 of Ord. 1995-12-33)

13.25.340 Single-family home construction.

The construction of single-family homes, duplexes, triplexes and their accessory structures that fall into one of the categories below and meet the conditions stated for that category, are exempt from the provisions of Article II (Standard Requirements) and Article IV (Other Provisions) of this chapter.

(1) Previously Reviewed and Approved Site. The development site or parcel is included in an approved final stormwater plan that meets the requirements of this chapter or a stormwater plan was approved that provided for detention or retention of runoff from residential lots.

(2) Existing Lots of Record. All residential structures built on A, B or C soils shall be constructed with roof downspout systems in accordance with Section 13.25.220(3)(f). (Sec. 1 of Ord. 1994-01-47; amended by Sec. 1 of Ord. 1995-02-19; amended by Sec. 1 of Ord. 1995-12-33)

13.25.350 Small residential projects.

(1) Qualifying Projects. Small residential projects include single-family residential short plats and subdivisions of four (4) lots or less.

(2) Treatment and Runoff Control Requirements.

(3) Information Requirements. The submittal requirements (Section 13.25.200) for small residential projects are modified as follows:

(a) An abbreviated preliminary stormwater plan as outlined in Section 13.25.420 can be substituted for the preliminary stormwater plan.

(b) A technical information report (Section 13.24.200(2)(d)(iii)) shall not be required, however, sufficient information and data shall be provided with the final stormwater plan to allow the director to determine conformance with the applicable provisions of this chapter. (Sec. 1 of Ord. 1994-01-47; amended by Sec. 1 of Ord. 1995-12-33)

13.25.355 Portable school buildings.

Temporary portable school buildings shall be exempt from the quantity and quality provisions of this chapter, provided the buildings utilize roof downspout systems. A final stormwater design that addresses disposal of stormwater shall be required. (Sec. 1 of Ord. 1995-12-33)

13.25.360 Other exemptions.

Drainage Projects.

(1) Drainage projects that are not a part of a development activity are exempt from the water quality treatment provisions of this chapter (Section 13.25.210).

(2) For drainage projects that are not part of a development activity, the director may waive all or parts of the submittal requirements (Section 13.24.200), maintenance and ownership requirements (Section 13.25.230), and bonding and insurance requirements (Section 13.25.240(4)) if the project meets the other appropriate parts of this chapter. (Sec. 1 of Ord. 1994-01-47; amended by Sec. 1 of Ord. 1995-12-33)"

REFERENCES

Washington Department of Ecology, February 1992, Stormwater Management Manual for the Puget Sound Basin, Report 91-75, Olympia, WA.

Wessel, A.E., October, 1996, Washington Department of Ecology, Correspondence to Clark County regarding Stormwater Control Regulation Equivalency.

O'Brien, E.O., February, 1996, Washington Department of Ecology, Correspondence to Clark County regarding possible changes from the Puget Sound Permit for Clark County's permit application.

Washington Department of Ecology, March 1994, Guidance for Local Governments when Submitting Manuals and Associated Ordinances for Equivalency Review: Publication #94-45.

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APPENDIX D

PROPOSED CAPITAL PROJECTS

CLARK COUNTY
STAFF REPORT

DEPARTMENT/DIVISION: Public Works/Environmental Services

DATE: July 1, 1998

REQUEST: A supplemental appropriation of $145,000 in the Public Works Operations Fund Fund for the design and construction of fifteen drainage capital improvement projects to address the highest priority flooding problems in the Lakeshore and Salmon Creek areas.

CHECK ONE: [ ] Consent [ ] Discussion

BACKGROUND: The Lakeshore and Salmon Creek Watershed areas have a serious drainage problem resulting from inadequate drainage infrastructure. The areas suffer regular spot flooding. Fifteen initial stormwater capital improvement projects are recommended to address those problems rated highest among the high priority flooding problems. Attachment "A" describes the proposed projects in more detail.

Selection of projects was based on the list of priority Capital Improvement Projects prepared for the Lakeshore and Salmon Creek Watershed Areas Plan ("A" projects, April 7, 1998 draft). That list was based on data developed after the flood of February 8, 1996. The projects were then reviewed in conjunction with the Maintenance and Operations Division to confirm their priority, include additional problems that have developed since 1996, and include "Small Capital" projects that would have been funded from the increased Maintenance and Operations funds recommended in the Lakeshore and Salmon Creek Watershed Areas Plan. The resulting priority list was then reviewed in the field, and the finalized list and recommendations developed based upon the Board of County Commissioners priority of protecting structures from flooding.

COMMUNITY OUTREACH: The identification of the problem areas and proposed solutions were part of four public open houses in February 1997, and a Board of County Commissioners' Hearing in March 1997, addressing flooding concerns in the Lakeshore and Salmon Creek areas. The Washington Department of Fish and Wildlife will review each proposed drainage capital improvement project. County staff will coordinate with private land owners, the Vancouver School District, and the City/County Parks Department to use their land to build some the drainage facilities.

ACTION REQUESTED: Approve 1998 supplemental appropriation of $145,000 in the Public Works Operations Fund for the initial design and construction of fifteen drainage capital improvement projects to address the highest priority flooding problems in the Lakeshore and Salmon Creek areas. Approve addition of the drainage projects to the Annual Construction Program. Approve $1,870,565 plan as proposed.

BUDGET IMPLICATIONS: The cost of the drainage capital improvements will total nearly $1.9 million over 2 years. Of this amount, $145,000 will be performed by the Public Works Operations Division in 1998, requiring a supplemental appropriation this year. An additional $80,000 will be spent in 1998 for design functions within the Road Fund. Both amounts will be taken from existing budget

authority in the Road Fund by shifting funds from projects included in the approved 1998 Capital Improvement Program that will not be completed until 1999.

POLICY IMPLICATIONS: The construction of the proposed drainage capital improvements will partially assist the County in complying with the requirements of the Western Washington Hearings Board's Order to fix current drainage infrastructure deficiencies.

DISTRIBUTION: Please provide one copy of the approved staff report to the Department of Public Works, the Auditor's Office, and the County Budget Office.

_____
Brian Carlson, Manager
Environmental Services Division

APPROVED: Ron S. Bergman
Director of Public Works

CLARK COUNTY WASHINGTON
BOARD OF COMMISSIONERS

RSB:ER:MB

Attachments: Supplemental Appropriation Budget/Budget Transfer
Lakeshore and Salmon Creek Watershed Areas 1998 Drainage Improvements

APPENDIX E

WATER QUALITY ORDINANCE

Ordinance No. _____

AN ORDINANCE relating to Water Quality implementing requirements of the federal Clean Water Act by adopting regulations and best management practices manuals for existing and new land uses in unincorporated Clark County, modifying penalties for certain prohibited activities, and adopting a new Chapter to Clark County Code and amending Sec 5 of Ord. 1977-12-51 as last amended by Section 1 Ord. 1995-04-22.

WHEREAS, it is in the interest of Clark County to protect surface water and ground water from pollution;

WHEREAS, it is in the interest of Clark County to protect the public interest in stormwater drainage systems and related functions of drainage basins, water courses and shoreline areas;

WHEREAS, Clark County is required to meet the requirements of state and federal law, and requirements of the County's NPDES municipal storm sewer permit; and

WHEREAS, Clark County will fulfill the responsibilities as trustee of the environment for future generations.

BE IT ORDERED AND RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF CLARK COUNTY, STATE OF WASHINGTON, as follows:

Section 1. New Chapter. There is hereby adopted as a new Chapter to the Clark County Code, Chapter 13.26 Water Quality which is attached hereto as Exhibit A and incorporated herein by this reference.

Section 2. Amendatory. Section 5 of Ordinance 1977-12-51 as last amended by Section 1 of Ordinance 1995-04-22 and codified as Clark County Code 32.04.050 is amended to read as follows:

CCC 32.04.050 Civil penalty.

In addition to or as an alternative to any other judicial or administrative remedy provided herein or by law, any person who violates any land use or public health ordinance, or rules and regulations adopted thereunder, or by each act of commission or omission procures, aids or abets such violation, shall be subject to a civil penalty as

provided in Table 32.04.050. Each day may constitute a new violation. All civil penalties assessed will be enforced and collected in accordance with the lien, personal obligation, and other procedures specified in this title or as authorized by law.

TABLE 32.04.050			
The penalties assessed against the violations are grouped as below for first, second and third offense within any five (5) year period as follows:			
Violation	**First Offense**	**Second Offense**	**Third Offense**
Building without permit	$100	$250	$500
Occupancy without approval	100	250	500
Dangerous structure	100	250	500
Grading without permit	100	250	500
No erosion control	250	500	1,000
Wetland protection	250	500	1,000
Surface mining	250	500	1,000
Water Quality Controls	250	500	1,000
Site plan	100	250	500
Auto wrecking	50	100	250
Setback	50	100	250
Sign	50	100	250
Occupancy of travel trailer	100	250	500
Nuisance	50	100	250
Home occupation/business	100	250	500
Shoreline	100	250	500
Clearing vegetation	100	250	500
All other violations	50	100	250

Section 3. Severability. If any section, sentence, clause or phrase of this ordinance should be held to be invalid or unconstitutional by a court of competent jurisdiction, such invalidity or unconstitutionality shall not affect the validity or constitutionality of any other section, sentence, clause or phrase of this ordinance.

ADOPTED this _____ day of _____, 1999.

Attest:

BOARD OF COUNTY COMMISSIONERS
FOR CLARK COUNTY, WASHINGTON

_____
Clerk to the Board

By: _____
Betty Sue Morris, Chair

Approved as to Form Only
ARTHUR C. CURTIS
Prosecuting Attorney

By: _____
Judie Stanton, Commissioner

By: _____ By: _____
Mel Gordon, Commissioner

EXHIBIT A

Chapter 13.26 WATER QUALITY

Sections:

Section 13.26.005. Purpose.

The purpose of this chapter is to protect the county's surface and groundwater quality by providing minimum requirements for reducing and controlling the discharge of contaminants. The Board of County Commissioners recognizes that water quality degradation can result either directly from one discharge or through the collective impact of many small discharges.

In furtherance of this purpose, the Board of County Commissioners prohibits the discharge of contaminants to surface water, stormwater, and groundwater as set forth in Section 13.26.025 and requires certain sites and activities to utilize best management practices as set forth in Section 13.26.035.

The Board of County Commissioners also recognize that the implementation of successful pollution control practices is most likely through a pollution prevention (water resources) education effort for business owners and the general public. In implementing this ordinance, the County will primarily rely on education and technical assistance to show individuals how to implement pollution control practices. Enforcement actions will normally be implemented when education and technical assistance measures are unsuccessful at protecting the public interest or when persons willfully contaminate the water resources of Clark County. Further it is not the intent of this Chapter to have the County pursue enforcement actions against persons whose actions or activities result in the discharge of de minimis amounts of contaminants into the water resources of Clark County.

The Board of County Commissioners finds this chapter is necessary to protect the health, safety and welfare of the residents of Clark County and the integrity of the county's resources for the benefit of all by: minimizing or eliminating water quality degradation; preserving and enhancing the suitability of waters for recreation, fishing, wildlife habitat, aquatic life, and other beneficial uses; and preserving and enhancing the aesthetic quality and biotic integrity of the water. The Board of County Commissioners recognizes that implementation of this chapter is required under the federal Clean Water Act, 33 U.S.C. 1251 et. seq. In meeting the intent of the Clean Water Act the Board of County Commissioners also recognizes the importance of maintaining economic viability while providing necessary environmental protection and believes this chapter helps achieve both goals.

Section 13.26.010. Education and Technical Assistance.

A. The Clark County Public Works Department shall develop a Storm Water Best Management Practices Manual and present this manual to the Clark County Planning Commission for review and the Clark County Board of County Commissioners for approval.

B. The Clark County Public Works Department will provide, upon reasonable request, available technical assistance materials and information, and information on outside financial assistance options to persons required to comply with this chapter.

Section 13.26.015. Definitions.

The following definitions shall apply in the interpretation and enforcement of this chapter:

A. "AKART" means an acronym for "all known, available, and reasonable methods of prevention, control, and treatment." AKART shall represent the most current methodology that can reasonably be required for preventing, controlling, or abating the pollutants associated with a discharge. The concept of AKART applies to both point and nonpoint sources of pollution.

B. "Best management practices" or "BMPs" mean the best available and reasonable physical, structural, managerial, or behavioral activities, that when used singly or in combination, eliminate or reduce the contamination of surface and/or groundwaters.

C. "Chapter" means this chapter and any administrative rules and regulations adopted to implement this chapter.

D. "Clean Water Act" means 33 U.S.C. 1251 et. seq., as amended.

E. "Contaminants" include, but are not limited, to the following:

1. trash or debris;
2. construction materials;
3. petroleum products including but not limited to oil, gasoline, grease, fuel oil, heating oil;
4. antifreeze and other automotive products;
5. metals in either particulate or dissolved form;
6. flammable or explosive materials;
7. radioactive material;
8. batteries;
9. acids, alkalis, or bases;
10. paints, stains, resins, lacquers, or varnishes;
11. degreasers and/or solvents;

12. drain cleaners;
13. pesticides, herbicides, or fertilizers;
14. steam cleaning wastes;
15. soaps, detergents, or ammonia;
16. swimming pool backwash;
17. chlorine, bromine, and other disinfectants;
18. heated water;
19. domestic animal wastes;
20. sewage;
21. recreational vehicle waste;
22. animal carcasses, excluding salmonids;
23. food wastes;
24. bark and other fibrous materials;
25. collected lawn clippings, leaves, or branches;
26. silt, sediment, or gravel;
27. dyes (except as stated in subsection C.1. of section 13.26.025);
28. chemicals, not normally found in uncontaminated water; and
29. any hazardous material or waste, not listed above.

F. "County" means the municipality of Clark County.

G. "Director" means the director of the Clark County department of public works, other department directors specified in enforcement procedures established pursuant to this chapter, or any duly authorized representatives of such directors.

H. "Discharge" means to throw, drain, release, dump, spill, empty, emit, or pour forth any matter or to cause or allow matter to flow, run, or seep from land or be thrown, drained, released, dumped, spilled, emptied, emitted or poured into water.

I. "Drainage facility" means the system that collects, conveys, and stores surface and stormwater runoff. Drainage facilities shall include but not be limited to all surface and stormwater conveyance and containment facilities including streams, pipelines, channels, ditches, swamps, lakes, wetlands, closed depressions, infiltration facilities, retention/detention facilities, erosion/sedimentation control facilities and other drainage structures and appurtenances, both natural and artificial.

J. "Farm management plan" means a comprehensive site-specific plan developed by the farm owner in cooperation with the Clark County Conservation District taking into consideration the land owners objectives while protecting water quality and related natural resources.

K. "Forest practices" means any activity conducted on or directly pertaining to forest land and relating to growing, harvesting, or processing timber, as defined in Chapter 222-16 Washington Administrative Code.

L. "Groundwater" means all waters that exist beneath the land surface or beneath the bed of any stream, lake, or reservoir, or other body of surface water, whatever may be the geological formation or structure in which such water stands or flows, percolates or otherwise moves.

M. "National Pollutant Discharge Elimination System" or "NPDES" means the national program for controlling pollutants from point source discharges directly into waters of the U.S. under the Clean Water Act.

M. "National Pollutant Discharge Elimination System permit" means an authorization, license, or equivalent control document issued by the Environmental Protection Agency or the Washington State Department of Ecology to implement the requirements of the NPDES program.

N. "Person" means an individual, their agents or assigns; municipality; political subdivision; government agency; partnership; corporation; business; or any other entity.

O. "Source control BMP" means a BMP intended to prevent contaminants from entering surface and stormwater and/or groundwater including the modification of processes to eliminate the production or use of contaminants. Source control BMPs can be either structural or non-structural. Structural source control BMPs involve the construction of a physical structure on site, or other type of physical modification to a site; for example, building a covered storage area. A non-structural source control BMP involves the modification or addition of managerial or behavioral practices; for example, using less toxic alternatives to current products or sweeping parking lots.

P. "State Waste Discharge Permit" means an authorization, license, or equivalent control document issued by the Washington State Department of Ecology in accordance with Washington Administrative Code.

Q. "Stormwater BMP Manual" or "manual" means the manual (and supporting documents as appropriate) describing best management practices, design, maintenance, procedures, and guidance which has been approved by the Clark County Board of County Commissioners or the Stormwater Management Manual for the Puget Sound Basin (Washington Department of Ecology (February 1992).

R. "Surface and stormwater" means water originating from rainfall and other precipitation that is found in drainage facilities, rivers, streams, springs, seeps, ponds, lakes and wetlands as well as shallow groundwater.

S. "Treatment BMP" means a BMP intended to remove contaminants once they are already contained in stormwater. Examples of treatment BMPs include: oil/water separators, biofiltration swales, and wet-settling basins.

Section 13.26.025. Discharges into Clark County waters.

A. Prohibited discharges.

1. It is unlawful for any person to discharge any contaminants, as defined in Section13.26.015 Definitions, into surface and stormwater, or groundwater.

2. Illicit connections. Any connection that could convey anything not composed entirely of surface and stormwater directly to surface and stormwater or groundwater is considered an illicit connection and is prohibited with the following exceptions: connections conveying allowable discharges, connections conveying discharges pursuant to an NPDES permit or a State Waste Discharge Permit, and connections conveying effluent from onsite sewage disposal systems to subsurface soils.

B. Allowable discharges. The following types of discharges shall not be considered prohibited discharges for the purpose of this chapter unless the director of public works determines that the type of discharge, whether singly or in combination with others, is causing significant contamination of surface and stormwater or groundwater:

1. Potable water;
2. Potable water line flushing;
3. Uncontaminated water from crawl space pumps or footing drains;
4. Lawn watering;
5. Residential car and boat washing;
6. Dechlorinated swimming pool water;
7. Materials placed as part of an approved habitat restoration or bank stabilization project;
8. Natural uncontaminated surface water or groundwater;
9. Flows from riparian habitats and wetlands;

10. The following discharges from boats: engine exhaust, cooling waters, effluent from sinks, showers and laundry facilities and treated sewage from Type I and Type II marine sanitation devices; and

11. Common practices for water well disinfection.

C. Exceptions.

1. Dye testing is allowable but requires verbal notification to the Clark County Public Works Director at least one day prior to the date of test. The Clark County Public Works Department, Southwest Washington Health District, or a sewer service purveyor is exempt from this requirement.

2. If a person has properly designed, constructed, implemented and is properly maintaining BMPs, and is carrying out AKART as required by this chapter or through another federal, state, or local regulatory or resource management program, and contaminants continue to enter surface and stormwater or groundwater, then that person shall not be in violation of subsection A. of this section.

3. If a person can demonstrate that there is no additional contaminants being discharged from the site above the background conditions of the water entering the site, then that person shall not be in violation of subsection A. of this section.

4. Emergency response activities or other actions that must be undertaken immediately or within a time too short to allow full compliance with this chapter, to avoid an imminent threat to public health or safety, shall be exempt from this section. The director of public works may specify actions that qualify for this exception in county procedures. The person responsible for emergency response activities should take steps to ensure that the discharges resulting from such activities are minimized to the greatest extent possible. In addition, this person shall evaluate BMPs and the site plan, where applicable, to restrict recurrence.

Section 13.26.035. Best management practices requirements.

A. Best management practices.

1. The Clark County Public Works Department shall develop a Storm Water Best Management Practices Manual and present this manual to the Clark County Planning Commission for review and the Clark County Board of County Commissioners for approval. The manual shall present BMPs and procedures for existing facilities and activities, and for new development activities not covered by the Clark County Stormwater Control Ordinance (Chapter 13.25). At a minimum, the manual shall describe the types of regulated activities; the types of contaminants generated by each activity, and the contaminant's effect on water quality; the required source control BMPs and available treatment BMPs, including information on design and maintenance; allowable use of alternative BMPs; and a schedule for BMP implementation. The BMP manual will also specify methods for future BMP manual revision.

2. Existing development, current activities, and new development activities not covered by the Clark County Stormwater Control Ordinance (Chapter 13.25) that are not listed in the exemptions of this subsection are required to apply stormwater quality BMPs listed in the Clark County Stormwater Quality Manual or the Stormwater Management Manual for the Puget Sound Basin. A BMP not included in these manuals may be approved by the director if it is demonstrated to provide equivalent effectiveness for applying AKART.

3. In applying the BMP manual for existing development, the director shall first require the implementation of non-structural source control BMPs. If these are not sufficient to prevent

contaminants from entering surface and stormwater or groundwater, the director may require implementation of structural source control BMPs or treatment BMPs, using AKART.

B. Exemptions. The following persons or entities are exempt from the provisions of this section unless the director determines the alternative BMPs to be ineffective at reducing the discharge of contaminants:

1. Persons implementing BMPs through another federal, state, or local regulatory or resource management program, provided the director may perform inspections to ensure compliance with this Chapter. If the other program requires the development of a best management practices plan, the person shall make their plan available to Clark County upon request;

2. Persons engaged in the production of crops or livestock for commercial trade; provided that such persons shall comply with the requirements of Chapter 13.51 CCC;

3. Persons engaged in forest practices regulated under Title 222 WAC, except for Class IV general forest practices as defined under Chapter 222-16 WAC; and

4. Persons conducting normal residential activities at property containing a single-family detached dwelling, duplex or triplex and modifications to it on a lot approved for such use, unless the director determines that these activities pose a hazard to public health, safety, or welfare; endanger any property; or adversely affect the safety and operation of county right-of-way, utilities, and/or other property owned or maintained by the county.

Section 13.26.045 Administration.

The director is authorized to implement the provisions of this chapter. The director of public works will coordinate the implementation and enforcement of this chapter with other departments of Clark County government.

Section 13.26.050. Enforcement.

A. The director is authorized to carry out enforcement actions pursuant to the enforcement and penalty provisions of Title 32 CCC.

B. The director is authorized to make such inspections and take such actions as may be required to enforce the provisions of this chapter. Such inspections shall be made in accordance with Title 32 CCC.

1. The director may observe best management practices or examine or sample surface and stormwater or groundwater as often as may be necessary to determine compliance with this chapter. Whenever an inspection of a property is made, the findings shall be recorded and a copy of the inspection findings shall be furnished to the owner or the person in charge of the property after the conclusion of the investigation and completion of the inspection findings.

2. When the director has made a determination under subsection 1 of this section that any person is violating this chapter, the director may require the violator to sample and analyze any discharge, surface and stormwater, groundwater, and/or sediment, in accordance with sampling and analytical procedures or requirements determined by the director. If the violator is required to complete this sampling and analysis, a copy of the analysis shall be provided to the director.

C. In addition to any other penalty or method of enforcement, the prosecuting attorney may bring actions for injunctive or other relief to enforce this chapter.

Section 13.26.060. Hazards.

Whenever the director determines that any violation of this chapter poses a hazard to public health, safety, or welfare; endangers any property; or adversely affects the safety and operation of county right-of-way, utilities, and/or other property owned or maintained by the county; the person holding title to the subject property, and/or other person or agent in control of said property, upon receipt of notice in writing from the director shall within the period specified therein address the cause of the hazardous situation in conformance with the requirements of this chapter.

Notwithstanding any other provisions of this chapter, whenever it appears to the director that conditions covered by this chapter exist requiring immediate action to protect the public health and/or safety, the director is authorized to enter such property, as provided by Chapter 32.04 CCC, for the purpose of inspecting and investigating such emergency conditions. The director may without prior notice order the immediate discontinuance of any activity leading to the emergency condition. Failure to comply with such order shall constitute a misdemeanor as specified in Title 32 CCC.

Section 13.26.070. Criminal penalty.

Any willful violation of an order issued pursuant to Section 13.26.050 or Section 13.26.060 of this chapter for which a criminal penalty is not prescribed by state law is a misdemeanor.

Section 13.26.080. Construction-Intent.

This chapter is enacted as an exercise of the county's power to protect and preserve the public health, safety and welfare. Its provision shall be exempted from the rule of strict construction and shall be liberally construed to give full effect to the objectives and purposes for which it was enacted. This chapter is not enacted to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefited by the terms of this chapter.

The primary obligation of compliance with this chapter is placed upon the person holding title to the property. Nothing contained in this chapter is intended to be or shall be construed to create or form a basis for liability for the county, the department, its officers, employees or agents for any injury or damage resulting from the failure of the person holding title to the property to comply with the provisions of this chapter, or by reason or in consequence of any act or omission in connection with the implementation or enforcement of this chapter by the county, department, its officers, employees or agents.

Section 13.26.090. Effective date.

The provisions of this chapter shall be effective immediately with the exception of section 13.26.035 which shall become effective, without further action of the Board of County Commissioners, 30 days after the Washington State Department of Ecology issues Clark County a NPDES permit for discharges from its municipal separate storm sewer system**,** or September 30, 1999, whichever is later.

Section 13.26.100. Severability.

If any provision of this chapter or its application to any person or property is held invalid, the remainder of the chapter or the application of the provision to other persons or property shall not be affected.